

# MODEL BUILDER

JULY 1974

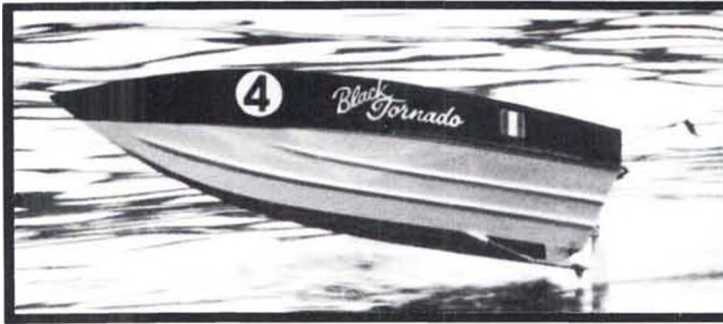
volume 4, number 32

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**Mono** — Typical hardware for SK-Daddle 20 and 40 with inboard rudder installation. (Outboard rudder mount similar to Deep Vee.) Trim plates (not shown) are available. Includes hardened aluminum motor mount, welded brass turn fin, plated steel flywheel, brass or steel universal with hardened steel pin, brass water pickup tube and rudder assembly, threaded drive shaft for plastic prop with shear pin hole for unthreaded prop. Drive dog is used for certain types of special props. Stuffing box has Oilite bearings.



**Deep Vee** — Typical hardware for Deep Vee 20F, 40F, 60 and 60F — basically similar to that for hydros. Stuffing box contains needle bearings and tube for greasing. Deep Vee hulls use Octura or Marine Specialties engine mounts.



**Scale** — Typical hardware for powering Trojan Cruiser, Coast Guard Life Boat and similar scale models. Single or multi-motor and/or shaft installations are possible using the Adapt-A-Drive transmission unit illustrated, as well as for increasing or decreasing gear ratio, changing distance between shafts and selecting counter-or same-way- rotation of props. Includes brass gears with Oilite bearings, nylon coupling rods, universals, shafts, brass stuffing boxes, nylon struts and props. Rudder assemblies are brass with plated steel steering arm. Servo-operated Dumas speed and direction control unit provides proportional forward and reverse speeds and neutral. Famous Dumas Pittman motors are available in 6- and 12- volt versions.

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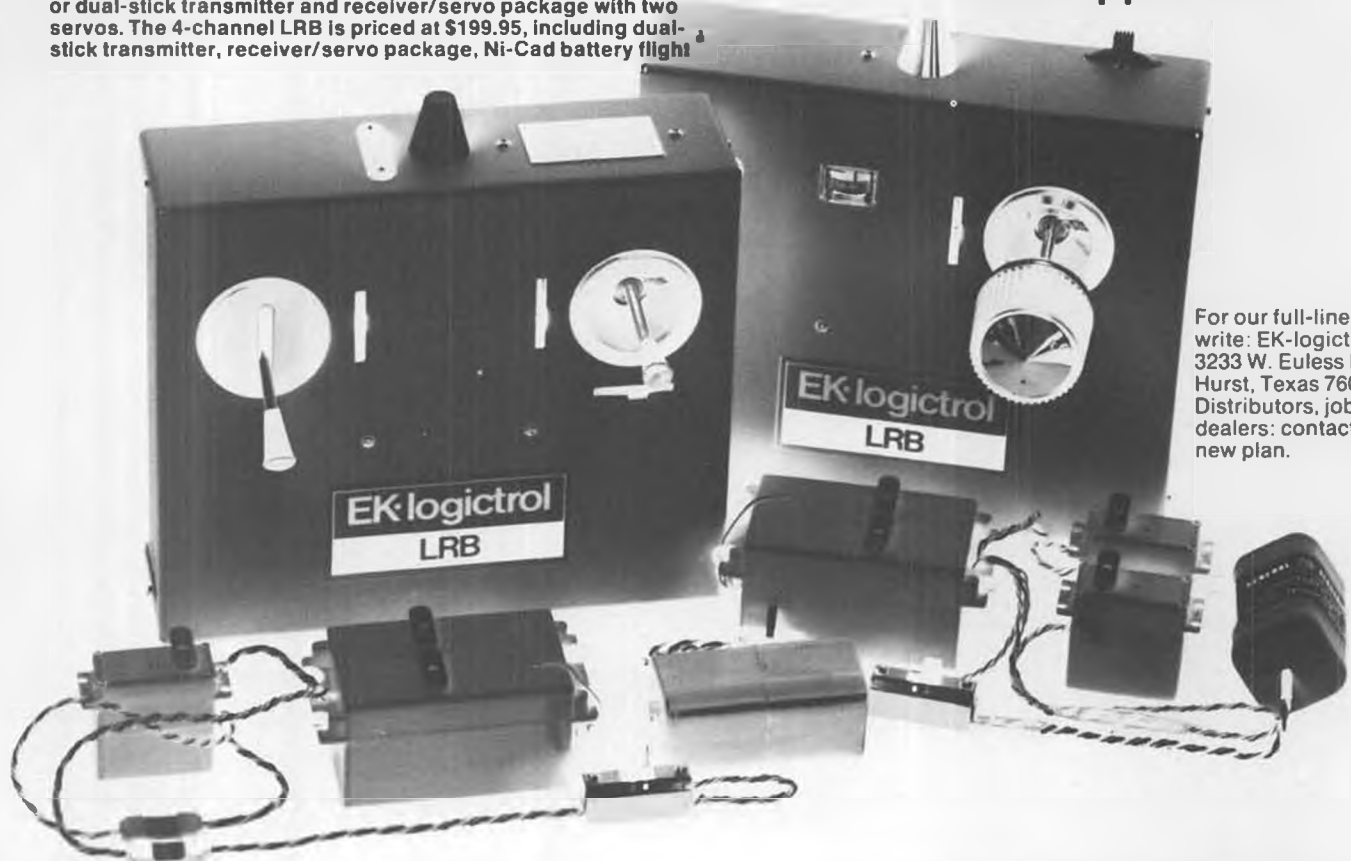
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R/C Pattern World  
Championships.  
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R/C Twin Trainer  
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Schmidt.  
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Fokker E-III R/C scale.  
Al Vela's E-Z Boy 1/2A  
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Fiberglassing over balsa,  
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Baby Boomer, s...  
.020 F/F  
Paper (?) ... CO<sub>2</sub>  
jet  
Liv... out semi-scale  
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biipe for .60 power.  
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JULY

1974

volume 4, number 32

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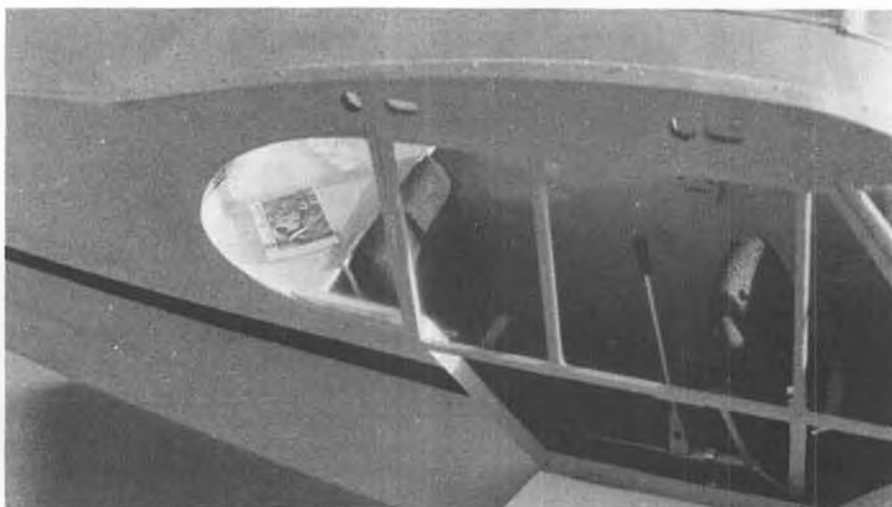
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Cover: The Curtiss A-12 "Shrike" on the cover, designed and built by Charlie Smith, Snowmass, Colorado, quite possibly represents a first in modeling, at least as far as magazine construction articles are concerned (Begins on page 8). The airplane is both ukie and radio controlled, with conversion from one to the other being only a matter of minutes. It also represents a live rebuttal to the popular "rock-on-a-string" concept of most control-line models . . . and to the stick-n-tissue, F/F scoffers of U and R/C scale, we say . . . don't knock 'em 'till you've flied 'em!  
Kodacolor photo by Charlie Smith



Take a close look at that magazine on the shelf in Brick Brickner's F/F Scale J3 Cub. Excellent taste, we'd say! The 5 ft., .15 powered model was 2nd at the National F/F Champs.

## from Bill Northrop's workbench . . .

### SABOTAGE!

● We suspect there's a clever plot afoot to sink MODEL BUILDER. The method being used is pretty sneaky and appears quite innocent.

A short time ago we received a small package marked "Plain Wrapper Publications," Jacksonville, Florida. Expecting something entirely different, we were nevertheless pleasantly surprised to unwrap an Avon pocket book entitled "Nothing By Chance." The author was Richard Bach, and if that name doesn't happen to click, try "Jonathan Livingston Seagull!" Dick has also written two other flying books, "Biplane" and "Stranger To The Ground." "Nothing By Chance" is the true account of a modern day pilot who set out to recapture the excitement, romance, and what's-around-the-corner adventures of barnstorming in the '20's and '30's. Dick and some friends spent a summer in the mid-west, flying from small town to small town, selling rides and giving aerobatic demonstrations. They flew a 3-place Parks biplane, a Luscombe, and a Travelair 2000 biplane; slept in the grass under the wings of their planes; performed their own repairs; and, refusing "help from home," lived from day to day on the money made doing their thing . . . sometimes having just enough to put off hunger with a hamburger and milkshake.

Anyway, the upshot of the whole thing is that we couldn't put the book down until it was finished . . . which just about finished MODEL BUILDER!

O.K., Dave Linstrum, did Walt Schroder put you up to it?

### THOSE BEER CAN HATS!

Don't joke around with modelers. You never know when they're going to take something seriously!

In the May issue, we published a couple of pictures of John Brodbeck Jr's "Beer Can" hat, made by his wife Charlene. Just for the heck of it, we

said in the caption to write to John for the pattern. Lo and behold, a whole bunch of requests have come to our office . . . many from modeler's wives!

So . . . we're trying to track down some info on how the hats are made, and who knows . . . maybe MODEL BUILDER will publish the most unusual construction article of the year! At least the materials aren't too difficult to come by . . .

### SO UNITE, ALREADY!

We're strong believers in the thought behind Fred Komlosy's remarks in his Palm Beach (Florida) Aeronauts newsletter for April, 1974, and quote him as follows:

"One cannot help but notice these days, when reading any model magazine, about the formation of special interest groups, N.M.P.R.A. (Racing), A.R.C.H. (Helicopters), L.S.F. (Gliders), N.F.F.S. (Free Flight), S.A.M. (Oldtimers), N.S.-R.C.A. (Pattern) and more to come in control line pattern, scale (?). The only one we belong to, ironically, is N.F.F.S. and we do not question the value it has been to free flighters, and likewise other groups for their respective followers.

"We do have to admit to sort of a nagging concern along the lines of "united we stand divided we fall," etc. The general interest modeller may end up joining five or six groups in addition to the AMA. Will an NMPRA man lose touch with his NSRCA buddies, will bickering follow, then separate magazines??? We don't know the answer to these questions but we sincerely hope that reason and cool heads prevail. We don't like to see snide references to R/C in the NFFS bulletin any more than the zilch reception for a peanut scale contest within an R/C group. A lot of fun bets could be missed. So, we will wait and watch and keep our fingers crossed. All these people really do need each

other. Think about it."

### LIKE WE SAID . . .

Don't joke around with modelers. In the May 1974 issue, we published Walt Mooney's "Sparrowhawk" Peanut Scale plans, and for the fun of it, in one of the picture captions, challenged any modeler to beat Walt's time of 53 seconds indoors, with a Sparrowhawk, at a contest. Within a few weeks of publication, we received the following letter from Bill Hiscock, Fort Lauderdale, Florida:

"Dear Bill: I built Walt Mooney's Sparrowhawk to see if I could win a subscription, and it turned out to be my best flying peanut scale yet!

"The construction was right off the plan except for sliced ribs and laminated tips. I also used 1/20 Sig contest balsa (The last of some very light wood that I have had for 5 years.). The plane was covered with condenser paper dyed yellow with food coloring and rubbing alcohol, and trimmed with red Japanese tissue. The weight was about 3 grams without rubber.

"My model flew left with .060 Pirelli 18 inches long and a Kayson plastic prop, and required no ballast or thrust adjustment. The 56 second flight was hand launched before trimming was complete.

"After twisting more pitch into the prop and more careful winding (1750 turns) it made 3 flights R.O.G. of 1:13.6 - 1:10 - 1:11.5.

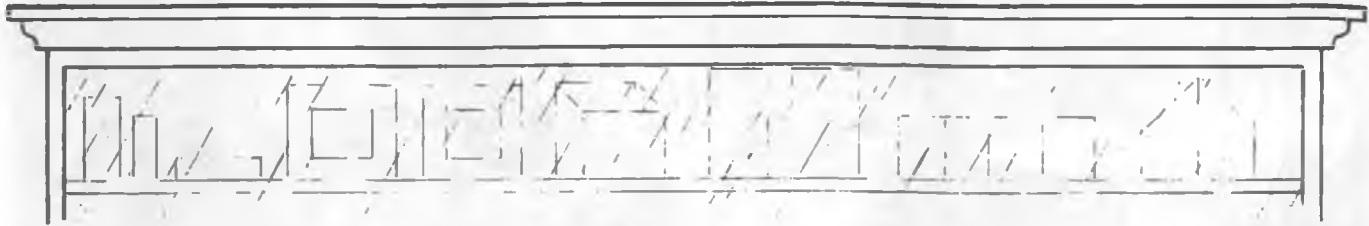
"As I had no 3-views, I wound up second in flying and last in scale, which resulted in 3rd place for the Miami contest. The little ship was later reduced to fragments when it slipped out of the holder while winding and no pictures had been taken.

"Please tell Walt that I am going to build another for our outdoor meet in June and I would appreciate information

*Continued on page 71*



# OVER THE COUNTER



● Allied Hobbies, 8655-2 Belford Ave., Los Angeles, California 90045, introduced a new sport and pattern R/C model called the "Integra" during the 1974 MAC Show. Designed for retract gear, a fixed gear is supplied in the kit, which retails at \$67.50.

Having a span of 70 inches (735 sq. in.), the ship averages 7-1/4 pounds dry, with retracts, and is quite obviously for .61 engines and a minimum of 4 channels of R/C. A 12 page instruction booklet, which includes recommended techniques for covering and finishing, accompanies the selected ply and balsa materials (wing construction . . . foam core or otherwise . . . is not specified), deluxe canopy, all hardware, and fully detailed drawings.

\* \* \*

Two of the four Peanut Scale ships by Bob Peck that were shown in last month's "Hannan's Hangar" column have now been released in kit form by Peck-Polymers, P.O. Box 2498, La Mesa, California 92041 . . . the Andreason BA4-B Swedish homebuilt biplane, scaled by Walt Mooney, and the Nesmith "Cougar," by Clarence Mather. Clarence, incidentally, set a world's peanut scale record of 9 minutes, 29 seconds with this model on August 26, 1973.

Both kits are typical Peck-Polymer quality, with all materials necessary to



Sig has kitted Tom Stark's 1973 Nats winning Monocoupe rubber scale ship. To be released soon. Span is 24 inches.

build the models except dope and glue. Those materials include Mylar press-on decals, top quality balsa, proof-of-scale 3-views, construction photos, colored tissue, and the well known Peck-Polymer nylon thrust bearing, plastic propeller and wheels. Each kit retails for \$2.95.

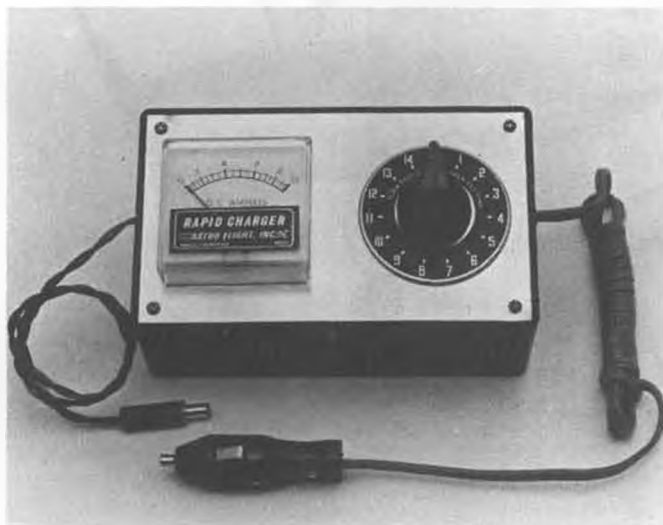
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New kits and accessories continue to appear for the increasingly popular 1/12 scale R/C racing cars.

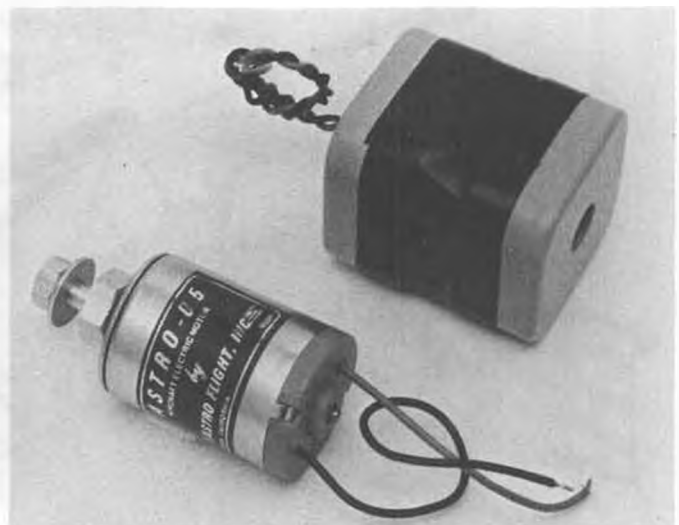
JOMAC Products, 12702 N.E. 124th St., Kirkland, Washington 98033, has

released a new Jerobee car, both in kit and R.T.R. form, the "ALFA." Standard features include a molded Lexan frame, independent front suspension, Ackerman steering, heavy-duty rear axle, centrifugal clutch, "Mag" type wheels, steel drive gear and injection molded main gear, and vacuum formed Lexan painted body.

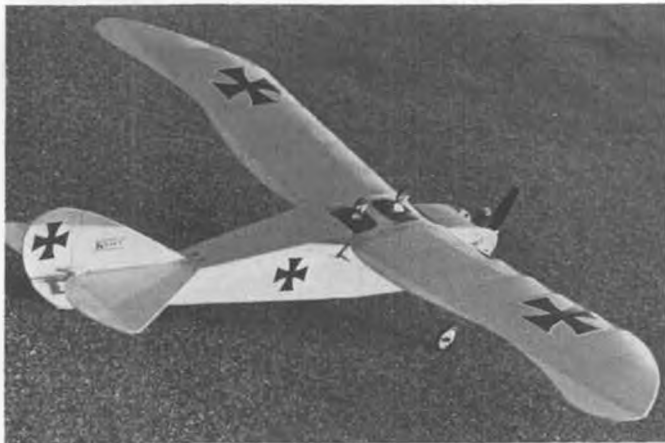
The radio, if purchased with the car (you can buy either way at retail prices of \$149.95 or \$59.95) is fully proportional 2 channel (under 100 milliwatt . . . no FCC license required), featuring



Astro Flight's rapid charger for its electric motor power packs. Works off car cigarette lighter socket.



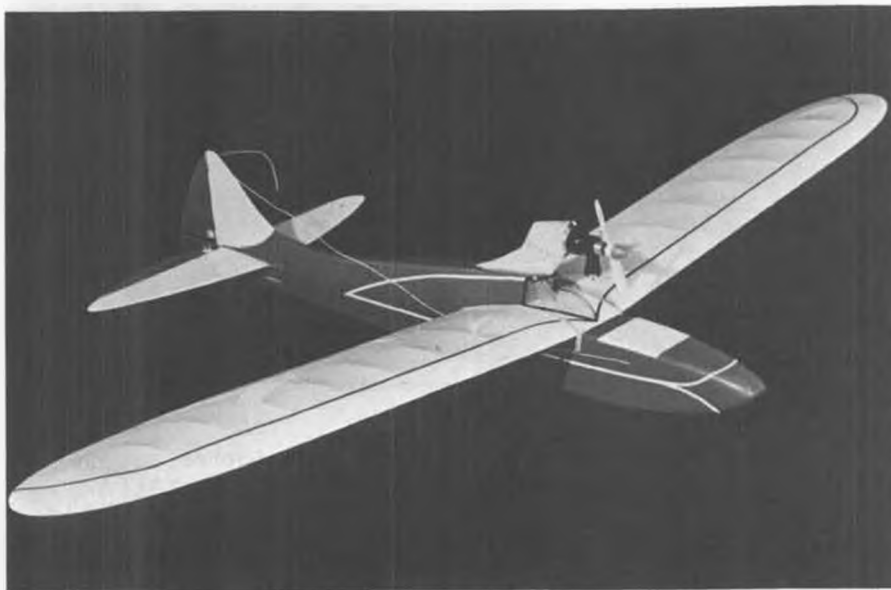
Astro Flight's new Astro 05 electric motor and power pack. For 1/2A size models.



Competition Models' semi-scale Taube for .020 F/F or .049 R/C.



Easy Rider R/C sailplane by Competition Models. Span 86 inches.



Ted Strader's Special Edition Plans is back and again producing his Gypsy, 60 inch powered sailplane.

interchangeable crystal capability and fine trim knob on transmitter steering wheel.

The car also includes these new features: aluminum flywheel, drum brake, 1 ounce tank, racing pan, bumper, special wide sponge tires and wheels (trued and glued), head heat sink, special heat sink mount, and Cox Tee Dee .049 engine. Car is capable of 32 MPH speeds, has a range of over 30 feet, and turning radius of 4 inches. All new items fit earlier Jerobee cars.

BoLINK Industries, P.O. Box 80653, Atlanta, Ga. 30341, which manufactures replacement accessories for Jerobee cars, has purchased inventory and tooling from Rigger Industries for its 1/12 scale items. Included in the purchase are wide front and rear racing tires, and seven Lexan bodies: Sigma, Chevron, Camaro, Ferrari, McLaren, Datsun 240Z, and the Cheeta. All bodies fit the Jerobee chassis, and come untrim-



Latest releases from Peck-Polymers are Andreason Bipe and Nesmith Cougar Peanut Scale kits.



Cardboard field box by HOJA Mfg.



Allied Hobbies 'Integra'.

med, (\$8.95), trimmed (\$10.95), and painted (\$12.95).

BoLINK also markets one ounce fuel tanks, "action brake," an electric starter, antenna support tube, gum ball racing tires, motor cleaner, hypo oiler and greaser, wire brush for clean-up, "hugger" and "grabber" donut tires, plated wheels, and the new "Rebel Grays" (colored racing tires).

\* \* \*

Competition Models, Inc., P.O. Box 8012, Long Beach, Ca. 90808, introduced two new items at the 1974 MAC Show: the "Easy Rider" R/C glider, and "Crystal Cover," a new plastic film covering material.

The Easy Rider, retailing at \$39.95, spans 86 inches and weighs between 25 and 30 ounces depending on radio installation. The kit includes die-cut ribs and plywood parts, pre-cut horizontal and vertical tail surfaces, all hardware, and the company's new "Crystal Cover" material.

"Crystal Cover" is a clear, tough, heat

sealing, plastic covering material. It can be used on small free-flights, right on up to large R/C ships. Coming in clear only, it can be painted with any model paint. It retails at \$4.89 for a 25 inch wide roll 76 inches long.

The company's little 40 inch span, semi-scale Taube, released last year, can be flown free-flight or single channel pulse to 3-channel R/C. Powered by an .020 to .049 engine, this all sheet balsa with built up wing model retails for \$10.95.

\* \* \*

Cardboard is not dead! With wooden field boxes ranging from 20 to 40 dollars a shot, cardboard is certainly in there solid, if you consider the fold-it-to-shape unit being offered by HOJA Mfg. Co., Box 40116, Indianapolis, Ind. 46240 at a list price of only \$2.98!

The PRO FLYTE CADDY, though designed around an R/Cer's requirements, should find immediate acceptance by free-flighters and U-controllers. It is made of white lined corrugated

carton stock with construction designed to carry the heaviest loads needed by modelers. The compartments will hold a gallon fuel jug, batteries, electric starter, props and tools in an "organizer" section, and a transmitter . . . inclined and tightly held so that it may be operated without removal from the box (for start-up and throttle dithering . . . not flying, dum-dum!) Overall

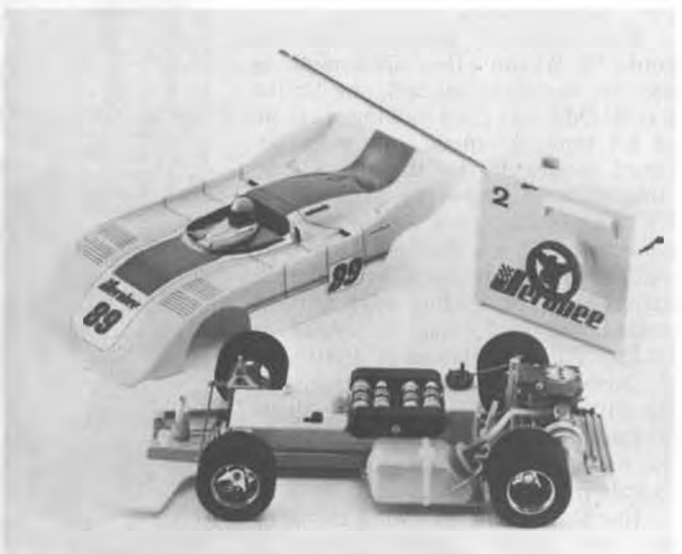
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BWT Systems' tach covers 0 to 30,000 in 10 different scales.



Assortment of BoLINK parts and accessories for 1/12 scale R/C race cars.



New 1/12 scale R/C race car by JoMac, which has taken over production of Jerabee line.



ALL OUTDOOR PHOTOS BY HARRY SUTHERLAND

# CURTISS A-12 'SHRIKE'

By CHARLIE SMITH . . . Our plane on this month's cover may be built as an R/C or U/C model . . . or you can do like the author, and kill two events with one bird! It converts either way in just minutes.

● What to build next? Isn't that always the problem? My wife and I were driving back from contests in Phoenix late January . . . in which I didn't place. Placing is not all that important, but somewhere close!

The U/C Bristol "Brisfit" and the old R/C P51 just didn't have it anymore. I like to fly both U/C and R/C scale. This year I wouldn't have time to build both another U/C and R/C.

What about one plane that could be built and flown both ways?

That's an idea.

O.K. What?

We stopped at the hobby shop in Grand Junction and picked up some Profile Publications . . . the Shrike (No. 128) included.

After looking them over, and plan books by Wylam (They are something else for the scale builder), the Shrike was it. Odd, but good looking, a classic of it's time. All metal, low wing, designed specifically for the attack role. Wing span 44', powered by a Wright RY1820 - 21 radial engine of 670 horsepower. It was the first plane to be used by the Army Air Corp with full span, automatic leading edge slots. It carried the mail, was in service at Hickam Airfield, Hawaii in 1940, and in China. It carried 4 machine guns in the wheel fairings (spats) and a single 30 caliber for the observer. The Shrike was probably the least recognized plane to train pilots in WW II.

The Shrike is a low wing tail dragger, with good moments, plenty of wing, and lots of detail. Also, at 1-1/2 inch scale there is plenty of room for

U/C and R/C gear. It is flown U/C with all radio gear aboard, except the receiver, and R/C with the bellcrank assembly and wing line guide removed. By the way, the Shrike flies well both ways.

## CONSTRUCTION

This will be broken down into fuselage, stab, fin, wing, engine, pilot, wheel fairings, hatch, and wind screen. For further details, there's a general discussion at the end of the article. Build in any order you like.

## FUSELAGE

Trace the bulkheads on the appropriate material and cut and sand to

shape. Bulkheads No. 1 and No. 3 have a 1/16 plywood doubler as shown. Epoxy these together. Make up two crutches of 1/8 x 1/2 spruce as shown. Note the step and spacer at the rear end. Cut engine bearers and assemble to bulkheads No. 1 and 2. Epoxy this assembly. Check for squareness . . . no down thrust or right thrust. Mark the crutch assemblies with bulkhead locations. Epoxy crutch to No. 1 and No. 2 bulkhead assembly. When dry, assemble bulkheads Nos. 4, 5, 9, 10 and 12. Check that these are 90° to the crutch and straight in the top view. When dry, install the balance of the bulkheads. Install 1/16 balsa sheeting between



The 'Shrike' with some select company. Note Noel Hess' Boeing F4B-4 in background. Prototype Shrike was Army Air Corps' first all metal plane. Model has 66 inch wingspan.



Dummy engine is entirely built up from scratch (Sorry about that, Williams Bros! At least he used your wheels). Webra 60 R/C engine.



Remaining cylinders are attached to shaped balsa cowl. Engine is almost completely hidden. Balsa skin throughout.

bulkheads 1 and 2, 2 and 4, 5 and 8. Install 1/4 sq. stringers as shown, also bellcrank rails and stab blocks. Now skin the frame with 3/32 balsa sheets. In tight contours, plank with 1/2 x 3/32 inch strips. Do not cover the bottom rear so as to install the push rods later.

Fit wing into fuselage. Trim as necessary so that the wing is 90° in both axis of fuselage. Hold in place so that stab can be installed, check for squareness. Glue and let dry. Install fin on centerline of thrust and 90° to stab. You know, with all this gluing and checking it's time for a beer. It's rough, but doesn't look too bad. Take a picture. As a matter of fact, take pictures all through construction.

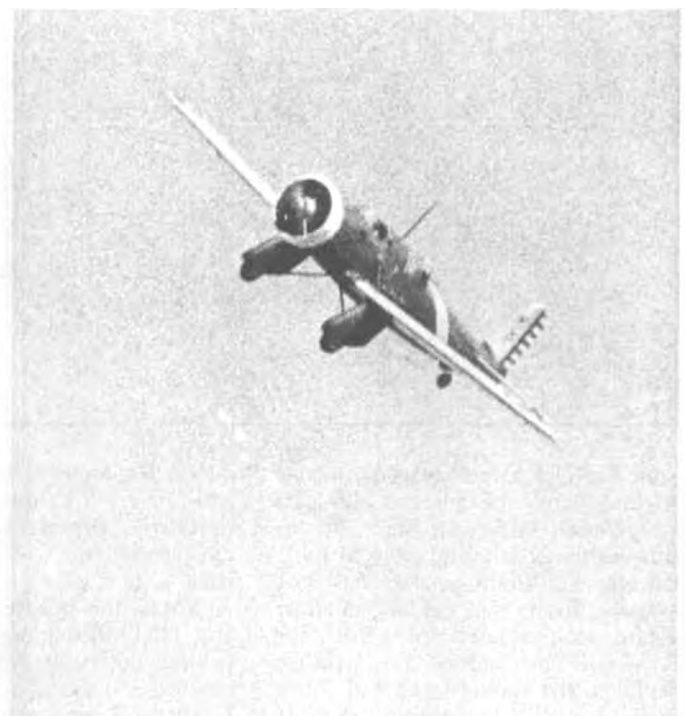
Remove wing. Now fit and hinge the rudder and elevators. Install servo rails and servo tray assembly. I used "Gold-N-Rod" push rods for these controls.



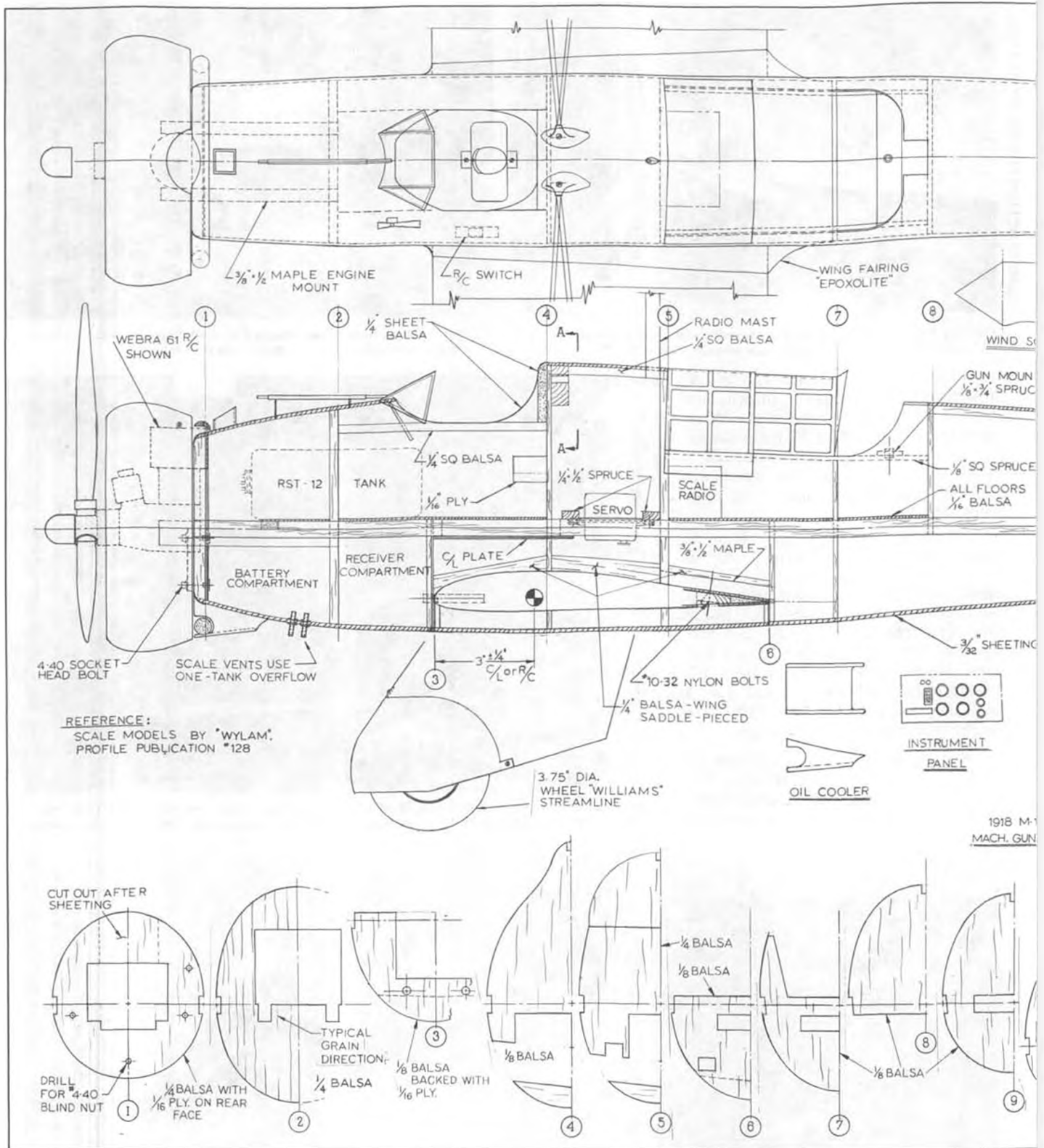
Charlie Smith and his dual purpose 'Shrike.' Note lead-out wires, and guide plate near left wing tip. Flying prop just about clears ring cowl. Radio gear remains aboard for U/C flights.



Charlie starts a takeoff. Note the right main and tail wheels are off the ground. Rudder and ailerons trimmed right for U/C.



The 'Shrike' is an impressive piece of machinery while in flight. Charlie says it flies well either way . . . radio or ukie controlled.



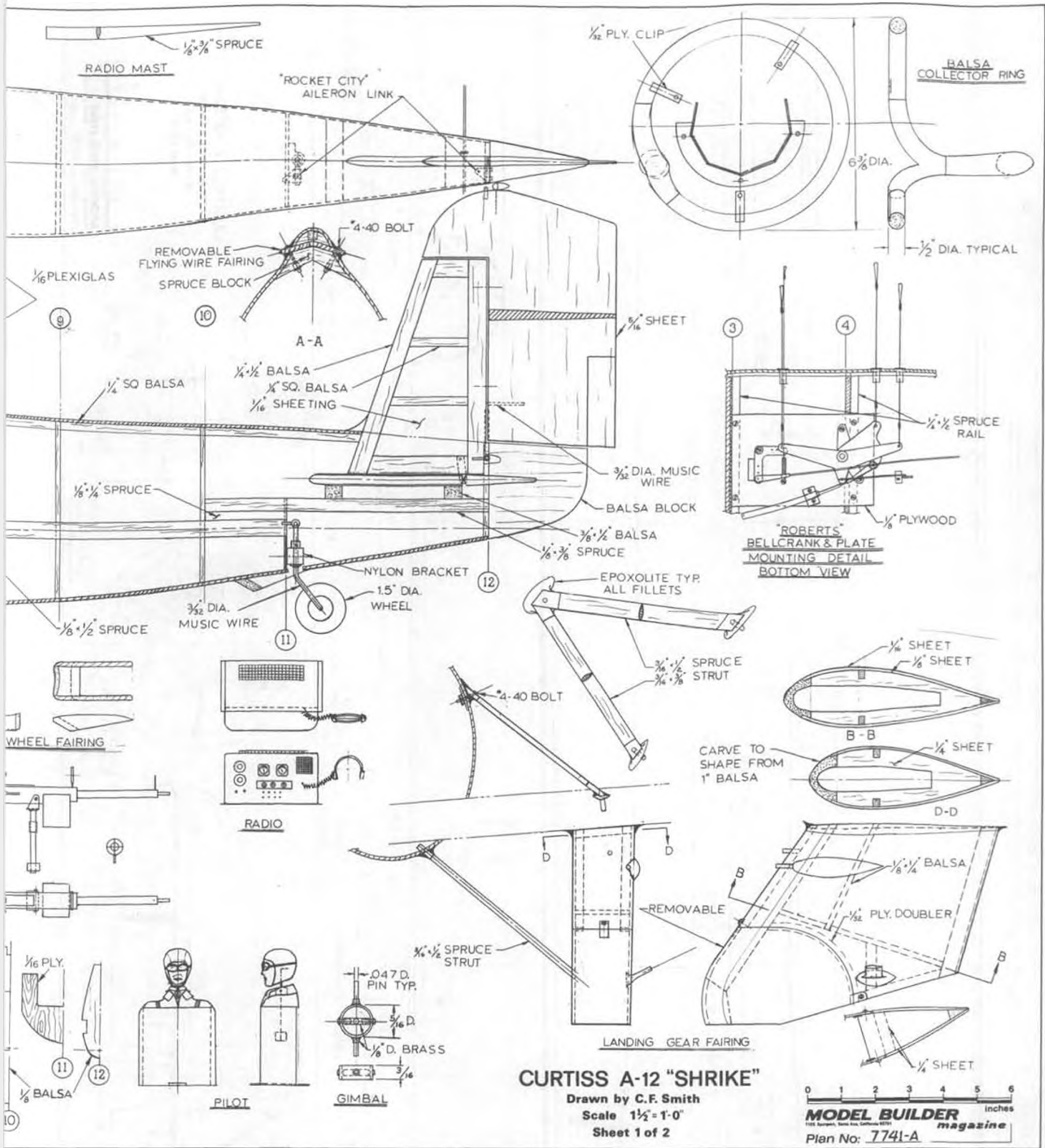
Install the push rod tubes using silicone cement to hold the tubes as they pass through each bulkhead. Make up the tail wheel assembly and bolt to bulkhead No. 11. Run a separate push rod assembly from the tail wheel tiller forward to the servo tray. Both the tail wheel and rudder are attached directly to the rudder servo arm. When complete, skin the bottom. Remove servos and tray, sand the assembly lightly, and fill in the bumps. Install 1/4

inch balsa doublers in wing saddle area, and 3/8 x 1/2 hardwood rails for wing tie downs. Replace wing and drill and tap rails for No. 10-32 nylon screws for wing bolts.

Install the headrest in the cockpit and fillet. Install the hardwood block behind bulkhead No. 4. Epoxy the plexiglass stationary canopy in place. Install the gun platform. Now turn the model upside down, and with wings installed, build fuselage wing fairing

with partial bulkheads Nos. 3, 4, 5 & 6. Sheet with 3/32 balsa strips. When dry, disassemble the wing from the fuselage. Finish sanding the wing, ailerons, flaps and elevators. Assemble the bellcrank unit and install. Note: The lead-out wires go through eyelets mounted in the skin of the fuselage. See detail.

Apply two coats of thinned clear dope. Sand lightly between coats. I covered these parts with silkspan, with



two coats of clear dope, sanding very lightly between. They were pinned with K&B primer coat. Sand with 240 wet sandpaper. When the wing was at this stage, it was assembled to the fuselage with a piece of Saran Wrap in the wing saddle area.

The fillet was made of Sig "Epoxolite." Take your time and form the fillet from the leading edge to the trailing edge. A small balsa shape was glued to the fuselage, both sides, and

the Epoxolite faired to this shape. While the Epoxolite is still soft, smooth it out. With a pan of water nearby, wet your finger and smooth out the fillet, wipe finger clean, rewet, and smooth some more. Let dry overnight. Epoxolite dries very hard, so take your time on the smoothing job. Avoid much sanding! Install oil cooler fairing, tail wheel fairing and carb. intake.

Fill cracks in the planking, the area of the stationary canopy, and the fin

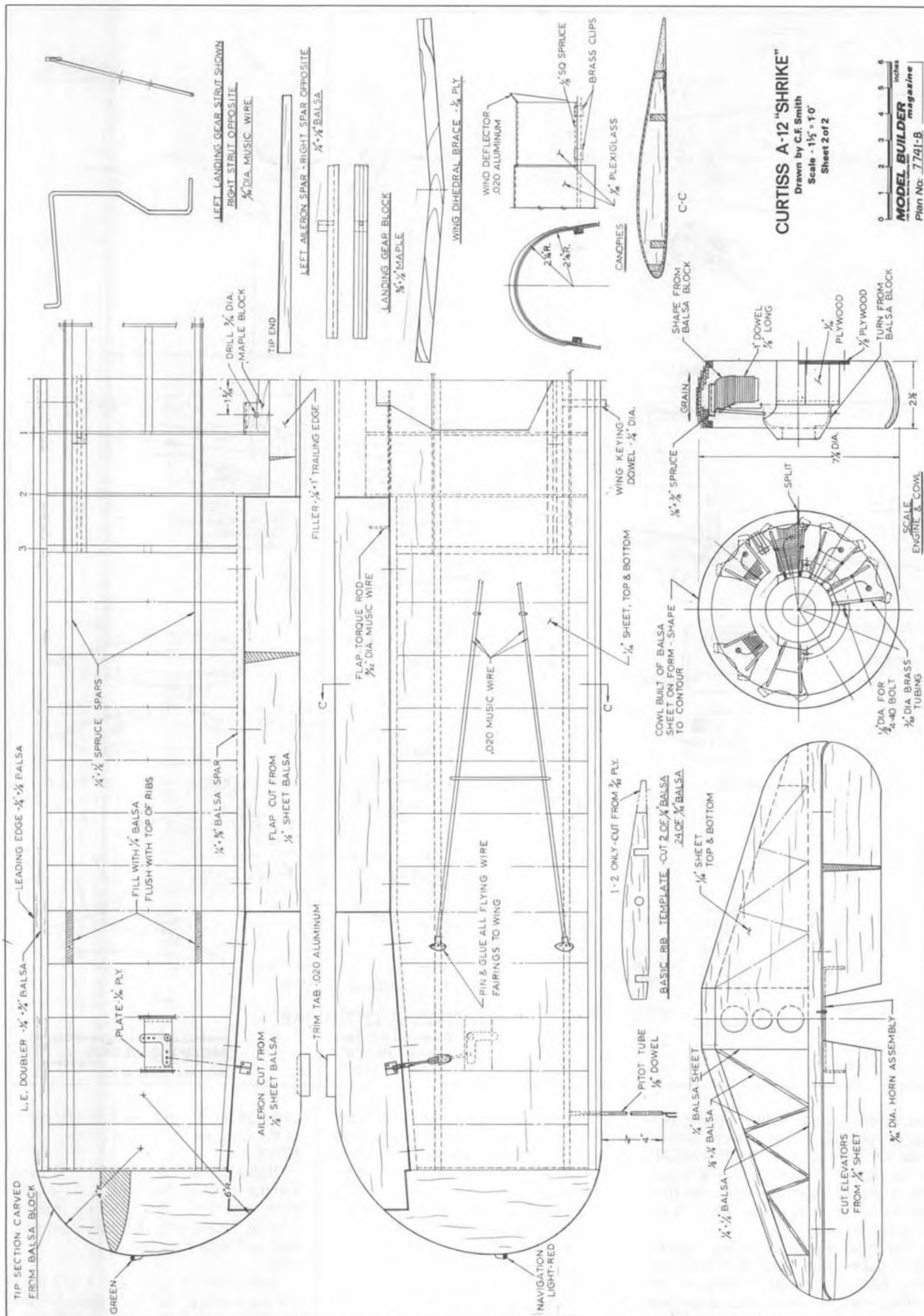
and stab area. Sand the fuselage, paper as the wing was done, and prime.

**STAB**

Build the stab using 1/4 x 1/2 balsa for the outline. The center is 1/4 inch sheet. Use 1/8 x 1/4 balsa for interior bracing. Sheet with 1/32 top and bottom and sand to shape.

**FIN**

Build the fin using 1/4 x 1/2 balsa for the outline and 1/4 square for the interior ribs. Cover with 1/32 balsa







All rigging is permanently attached to the wing, unbolts at fuselage when broken down for transporting. Right trim is put in by radio before ukie flights. Roberts control for U/C.



Prototype was still in use at beginning of WW II. Had short use as trainer.

sheeting. Sand to shape.

#### WING

Use the rib template to make 24 ribs of 3/32 balsa. Make two ribs from 1/4 inch spruce for station No. 3. Make four 3/32 ply ribs for No. 1 and No. 2 station. Make landing gear channel blocks of 3/8 x 1/2 hardwood. Note vertical support block. Make a left aileron spar of 1/4 inch balsa, noting that it tapers up as it goes to the tip block. Make a right spar which is opposite. Assemble the two wing panels.

Since the ribs are not quite flat bottom, place 1/16 inch shims under each wing spar in at least four places. Spars are 1/4 x 1/2 inch spruce, flap spar is 1/4 x 3/8 inch balsa, and leading edge is made up of two pieces, 1/4 x 1/2 and 1/4 x 3/4 balsa. Trim ribs Nos. 1, 2 and 3 to accept 1/16 plywood splice and landing gear block. Epoxy the assembly in this area. Make up trailing edge block and glue to No. 1 and No. 2 ribs. Also note hardwood block for wing bolts. Cut and shape per plan to fill this area between ribs No. 1 and No. 2. Install aileron bellcrank plate as shown, and glue 1/8 sq. under plate for support. Install bellcrank and 1/16 music wire pushrods to center section. Install spruce blocks between ribs in the cross hatched area. This is where the flying wires attach. Skin the top of the wing frames with 1/16 inch hard balsa. When dry remove these frame assemblies and install flaps and ailerons temporarily. Join the two panels, epoxying two wing splices as shown. Block up both assemblies for 2 inch dihedral. When dry remove and install two 1/4 dowels shown and sheet the bottom of the wing. Install wing tip blocks. Shape the tip blocks and leading edge of the wing and sand to final shape. Bend a left and right landing gear and install. Use four metal plates 1/4 x 1/2 in size to hold gear in slots . . . 2 wood screws per plate.

Install that good 60 R/C with No. 8 x 3/4 inch long panhead sheet metal screws. The main reason that bulkhead

No. 1 is balsa is to make it easy to cut out for engine clearance. Install push rod to the servo tray for R/C configuration.

#### EXHAUST COLLECTOR RING

The collector ring is made by butt gluing 1/2 inch balsa sheets together, making a 7 inch square plate. With a compass, draw two circles to size, see detail. Cut to the outer line . . . roughly. Mount the disc on an arbor so that you can use a hand drill for a lathe. File and sand the outer contour of the ring, then carefully file and sand to the inner line from both sides, being careful not to cut all the way through. With about 1/16 inch wall left, form the inner contour. When this is completed, remove from drill and cut the ring loose. Sand round. Lay the ring over detail and cut where indicated. Using blocks, form balance of exhaust assembly. Shape and sand and glue to ring. When dry, smooth out joints and install three plywood clips. Drill holes first for mounting screws. Locate on fuselage and install screws. Trim oil cooler fairing for 1/16 inch clearance all around. Install engine and trim ring so that no interference occurs. Remove exhaust ring, prime, and paint.

#### ENGINE AND COWL

Build crankcase as shown and install mounting flange per detail. With engine installed and controls hooked up, fit case over engine and bearers. Careful trimming will allow the case to fit against No. 1 bulkhead. Mark the bulkhead through holes in flanges. Remove the case and engine and drill and install 4-40 blind nuts. Make six cylinders from 7/8 inch dia. wood dowel, each 1 inch long. Epoxy as per drawing. Make eight cylinder heads per detail from blocks of soft balsa. Just take your time and it will get done. Make sixteen valve covers. Sand to shape and glue to cylinder heads, glue the assembly to cylinders. Paint the crankcase aluminum, cylinders dull black, valve covers aluminum. Cut sixteen 1/8 inch dia. brass tubing valve push rods. Cut

collars from 3/16 inch dia. brass tubing and mount on rods. Insert rods in holes of case and flush with valve collars. Epoxy. If you care to make plugs and ignition harness, good . . . it adds a lot of detail. Use soft wire. Don't worry about those 2 extra cylinders . . . We'll use them.

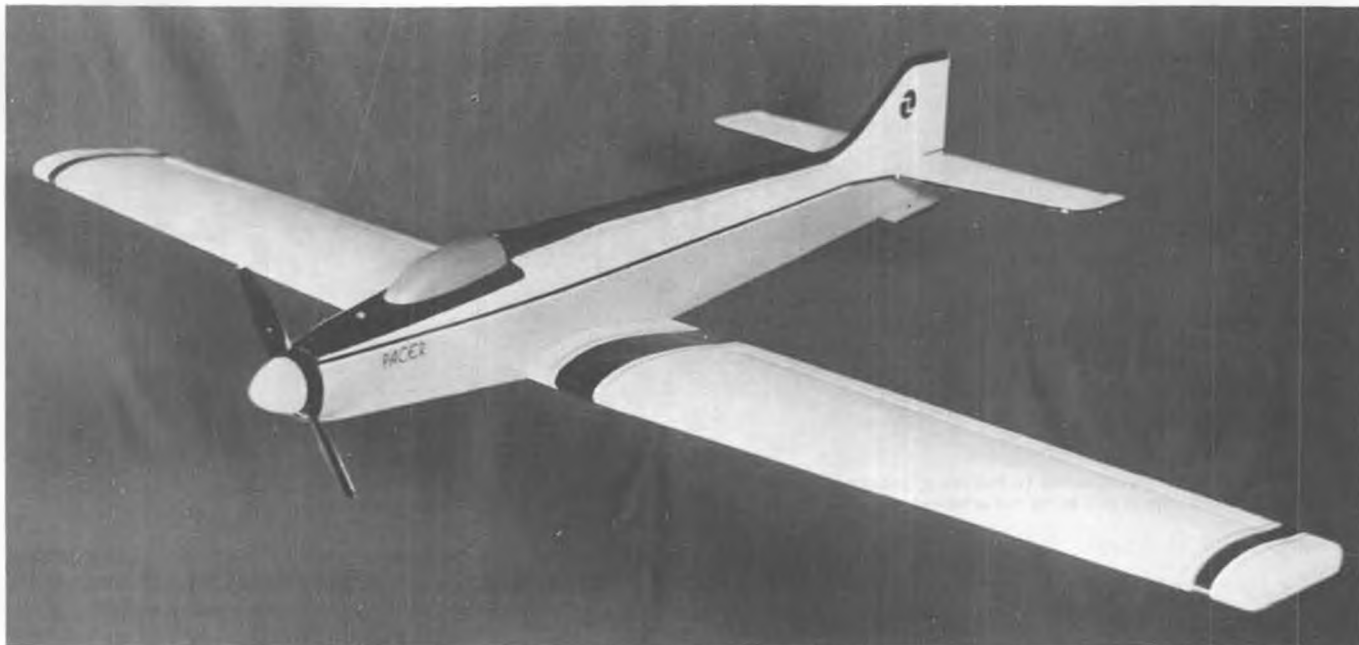
Make drag ring next. Mold it in fiberglass or build it up like I did, whichever you consider your cake. When completed, split as shown and wrap around engine. If it won't close, trim valve covers as necessary.

Now set engine assembly on a flat surface with the cowl ring around it. Tack glue the cowl to the engine valve covers, using epoxy in 2 or 3 places, and making sure that they are concentric to each other and that the split is in the proper location. Do not glue cowl to cylinder just above the split. Lay in the remaining two cylinder heads and glue to cowl. When dry, remove from the board and glue the remaining cylinders to the cowl. Now install your 60 R/C with needle valve and hook up. Reinstall the engine assembly. In order to do this, the cowl has to be opened up to go over the needle valve. Push assembly flush against the bulkhead. Install 4-40 flange bolts, close cowl. Fit cowl clip in place, mark hole location on bulkhead. Glue the clip to the cowl with epoxy and let dry. Remove engine cowl assembly and add gussets to clip and glue solidly. Drill bulkhead for 4-40 blind nut and install. Paint the inside of the cowl dull black.

#### PILOT

The pilot is made from a Williams Bros. 1-1/2 inch scale WWI pilot. Cut the head off with a hot X-acto knife. (Don't let anyone see you do this. They may think you're nuts!) Trim the parts to remove all the neck. Make a "gimbal" as shown in the detail. The center bearing must move freely on the 1/16 pins that are soldered to the 5/16 inch dia. ring. Drill a 1/16 hole in the center of the bearing. Solder two 1/8

*Continued on page 68*



Looks as though the idea of a small engined pattern airplane, as suggested by John Chapis in the May 1973 issue of MB (the .19 powered Bantoe) may be catching on. This is the .049/.051 powered "Pacer" by Ace Radio Control. Read more about it in Frank's column.

# RADIO CONTROL REPORT

FRANK  
SCHWARTZ

● I think I'm in trouble. Trouble, that is, if you can call having too many projects underway at one time and not being able to get to them all. Sort of like the story of the mad dog in the meat house . . . not knowing where to bite first.

Nevertheless, I press on . . . the Du-Bro Hughes Helicopter is half finished and so are half-a-dozen other projects. Probably the solution to my problem is to stop totally and completely taking on any new projects until all the old ones are done . . . of course, by then, there will be so many new kits and such that my mind may bend and break under the strain.

I'm sure many of our readers have the same malady. It is easy to identify . . . you know it well . . . the problem of being completely unable to resist any kind of kit. There it is, waiting to be put



Sterling Tri-Pacer by Tri-Cities (Tennessee) Aeromodeler Carl Cumbow, has logged 476 flights. One of the earliest R/C kits, it is still a great airplane. Photo by Roy Stephens.

together and the thing looks so easy . . . and before you know it, you are drowning in a sea of kit projects. That's the symptoms and the disease . . . The cure, other than lots of time in the

workshop, is still unknown.

\* \* \*

Among the projects due for "soon" completion are the Airborne Associates Phoenix 6 kit. If you like foam and



Elmer Good (lower left) is almost ready to release plastic, glass, and foam Big John kit after 2 years in the works. Weighs respectable 9-1/2 lbs ready to fly. Stringers molded into fuselage.



"And I say unto you . . ." When Orbit's Big John (Elliot) speaks, you will listen!

fiberglass construction, this kit is worthy of your consideration. Fuselage is by Skyglas, who, in my estimation, probably makes the finest fiberglass fuselages I've yet seen.

Then, along comes a little bit of a plane that caused quite a stir of excitement at the Toledo Show. It's by Ace Radio, is called the Pacer, and is due to be released in kit form any time now. This is one that should cause a lot of the big plane men to take notice. Imagine, if you will, a plane weighing only 22 ounces ready to fly and powered by a Cox .049 or .051, boring along doing rolls and loops and all the sophisticated maneuvers the "big guys" do . . . and all on two channels! The Pacer, from Ace R/C, is an Owen Kampen design and is a totally new concept in R/C model aircraft. It is a high performance 1/2A powered plane designed to have the high speed, solid tracking, smoother maneuvering, and axial roll characteristics of the modern large pattern ships, but in a small compact economical package using the Cox Tee Dee .049 and a two channel system with miniature servos and small battery



MAC Show prize winning sailplane design, "America", by Ron Bowlin and built by Peter Rambo. Features rolled 1/32 plywood fuselage and 1/16 balsa skinned foam wings. Span is 132 inches.

pack.

Ace R/C says it offers more excitement and ability-to-perform than ever seen before in it's size class. Span is 40 inches, and you can use ailerons and elevator, or coupled ailerons and rudder with elevator. It has a conventional balsa wood fuselage and tail group with, a

three section Ace molded foam wing. Kit will sell for \$19.95 and should be a winner! The plane has no landing gear (to clean it up and also save weight), but has a nose skid and wing tip skids that are part of the Horner tips. To quote Paul Runge of Ace R/C: "To see

*Continued on page 60*



Anita Northrop, Dawn Garratt, and Diane Grous "manning" MODEL BUILDER's booth at the MAC Show.



Competition Models' Sal Taibi points to the company's newest product, the 'Easy Rider' R/C glider. Partner Ray Van De Walker with tie.



Showing what can be done with his plans for the Jenny (Classifieds; April, May, June), Ralph Beck sent in these two photos of his model.



Best thing to do with this job is cover it with clear mylar to keep out the dust then build another one to fly. Note routed spars!



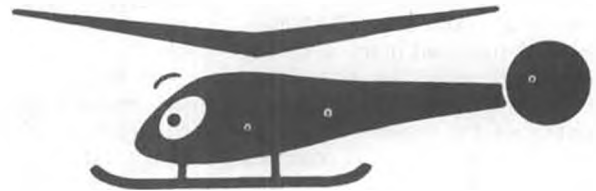
First place winner in the helicopter static division at the MAC Show was this Kavan Jet Ranger by Bill Ellis, Advisory comm. member.



Cliff Cottrell's Graupner Bell 212 Twin-Jet features unusual window treatment. Newest 212 kits have improved rotor system.

# CHOPPER CHATTER

By JOHN TUCKER



● Anyone who has ever experienced difficulty in his model building knows that the best encouragement possible is being able to discuss your problems with a fellow modeler who has also gone through the same difficulties. This is particularly true of the R/C helicopter enthusiasts because of the complexity of the model and the urgent desire for accomplishment (not to mention justification for all that money and time invested in the project!).

For some months now, "CHOPPER CHATTER" has been receiving the model helicopter data cards sent in by builders who have offered their skills and talents to fellow-modelers. Beginning with this issue, we will print the names and addresses of R/C model helicopter enthusiasts, the ships they have flown, and list special skills they are willing to share. Each month we will add more names to the growing list, so if you haven't already done so, send me the pertinent info and we'll get it in print! It's up to you to make contact with those listed . . . Here's the first group:

John D. Milliman, 1107 N. Oakcrest, Decatur, Illinois 62522. (217) 422-4261. (DuBro Hughes 300, and a scratch-built.) General flying and building skills.

Thomas Herr, Box 137 R.D.1, Paxinos, Pa. 17860. (717) 672-2306. (Hegi-Cobra, DuBro Hughes 300, Kavan Jet Ranger, DuBro Whirlybird.) All areas of design, construction, flying.

Cliff Cottrell, 22 Judson Place, Pacifica, Calif. 94044. 355-0895. (Scratch-built and Graupner 212.) Scratch-building, fiberglass and molds.

Connie Jones, Jr., 1189 Knotty Oaks Drive, Waco, Texas 76707. (817) 772-

3820. (Graupner 212.) General building and R/C equipment installation.

William R. Spahr, 149 Roosevelt Place, Palisades Park, N.J. 07650. 461-4983. (Hegi-Cobra, Kalt Jet Ranger, scratch-built.) Radio ham, digital engineer, K2ABU.

We have tried to list the names in relation to geographical location so that the greatest area will be covered. More next month.

\* \* \*

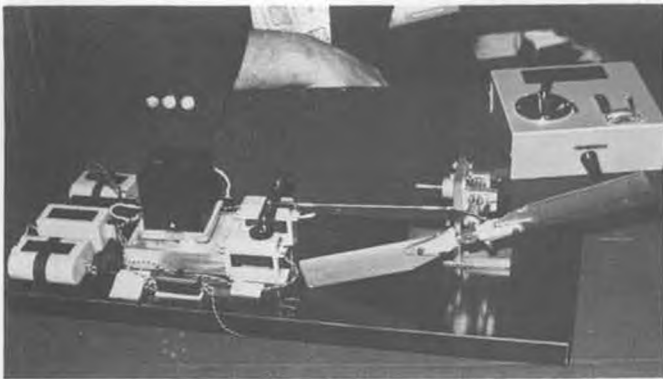
Last month, I had the good fortune to find time from my regular job to attend the M.A.C. Trade Show at the Anaheim Convention Center. Day one was spent looking over the new products, kits, and model displays while the second day called for picture taking and

watching the flight demos. I was very surprised at the lack of helicopter displays by manufacturers, although Franz Kavan had a booth with an impressive showing of his Jet Ranger along with miscellaneous model airplane parts and supplies. Dale Willoughby, of Model Helicopters, Tustin, also previewed his new "Scorpion Too" chopper which should prove to be quite a machine with the scaled down collective pitch mechanism ala Bowden-cable linkage! Watch for this one as soon as the method of marketing is decided (kit, semi-kit, or?).

Six model helicopters were counted on the static display line-up for judging. Top honors went to Bill Ellis, for his immaculate Kavan Jet Ranger, while Charlie Gilbert took second place with



Two of "Chopper Chatter" editor John Tucker's birds, seen at recent Orange Coast R/C Expo for cancer fund. Hege Bell Huey Cobra in foreground and Kavan Jet Ranger with Orbit xmitter.



Kavan tail rotor gyro stabilizer demonstration unit as seen at the MAC Show. Unit is very effective. Sells for around \$50.



Full size TV news helicopter had to get in on the act and landed at the MAC Show outside demonstration site.

his newly-designed 4-1/2 lb. lightweight, "FLUTTERBY." Third Place went to Ray Downs for his spit-and-polished Jet Ranger . . . as I was photographing Ray's Ranger, I overheard a spectator remark, "Gosh, if that's a third placer, I wonder what they have to do to get a first?"

Another fantastic creation was Cliff Cottrell's Bell 212, with a very unusual (painted) window treatment. Looks as though he airbrushed shadows on monokote film and then stuck it in place! Cliff, how 'bout telling us how you did that . . . lots of 212 owners would like to know!

Another fine scratch-built "Gene Rock SSP" was on display with the gyro controlled tail rotor, but I couldn't find out who built it. All in all, they were a tribute to the model builder's skill and devotion to the hobby . . . but there should have been at least three times that number considering it was the West Coast's greatest!

Around the corner, I saw Nate Rambo's Jet Ranger on display with Schluter mechanism installed. The fuselage shell is available at \$50.00 from Better Built Airplane Products, P.O. Box 163, Camarillo, Calif. 93010. Detail work is excellent and well worth the price. K and C distributors of Bellflower, Calif. had a super-detailed Bell Huey Cobra hanging from the ceiling and a Kalt Jet Ranger. In a not-too-prominent corner, Ed Sweeney showed his ingenuity with a new type of collective pitch control on his highly modified DuBro Super-Bird (It's amazing how much information you can pick up at a show like this . . . more ideas and techniques than we'll ever have time to try!). And finally, my own Jet Ranger was on display at the Orbit booth.

Outside, flight demonstrations were conducted several times each day. On hand was the Kavan team flying their Jet Rangers. An amazing R/C helicopter flight demonstration was made repeatedly by Ernie Huber, who really shows what maneuverability is! His "spinning take-off" is something to watch, since the chopper almost appears to be out of control until he deliberate-



Helicopter Advisory Committee member Ernie Huber demonstrated the Kavan Jet Ranger during the MAC Show. Ernie is one of the country's best chopper fliers. Has done movie work.



Prototype of the "Scorpion Too" to be produced by Model Helicopters.

ly stops the rotation in mid-air and charges off into the wild blue!

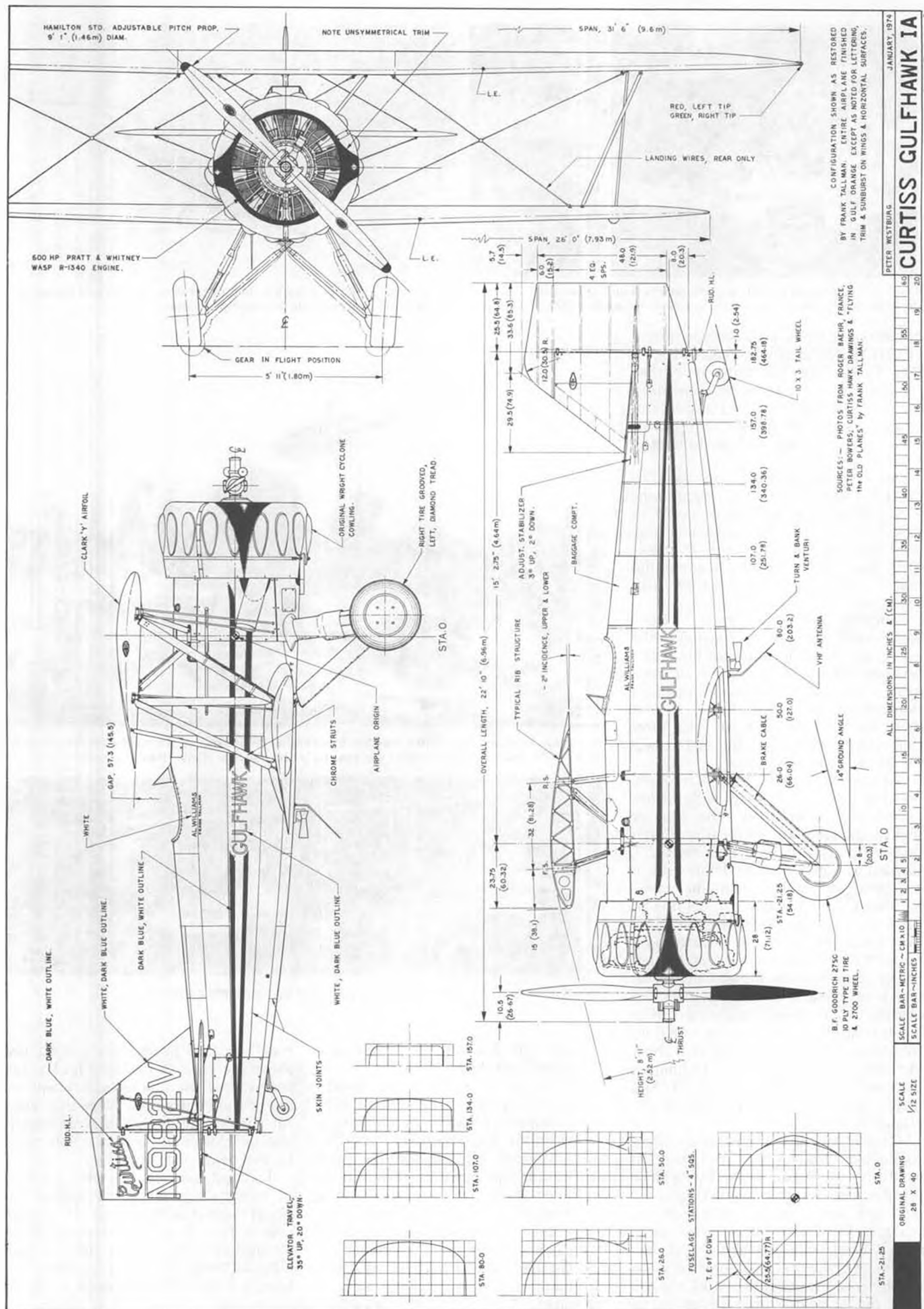
During one flight demo, the session was broken by the arrival of the KMPC news chopper (Traffic Watch) which landed on the demo pad! Ha! After the rotors stopped turning and the pilot stepped out, the undaunted Kavan team continued their demonstration around and about the full scale chopper!

I received a fine letter last week from Nick Ziroti, well-known model and R/C chopper builder on the east coast, who commented on one of our pictures captioned "Watch out Don, them things

bite." He said he recently got bit just above the knee by his latest Jet Ranger, and wanted us to stress safety and the use of good judgement! Very true Nick! All chopper pilots should avoid crowds and be extra careful 'cause you could be the next "incident."

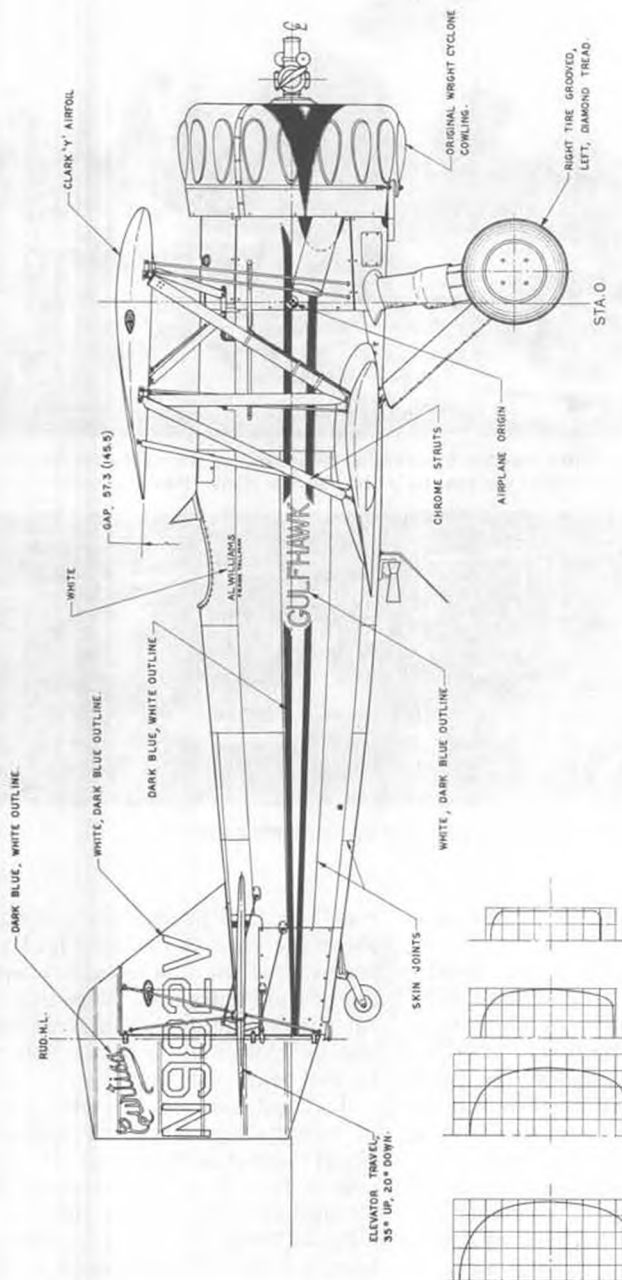
I almost gave up choppers a couple of months ago when my Cobra lost power and descended out of control over a long line of spectators. When the dust cleared, a young lady was seen lying in the grass with a scalp-cut . . . what a shock! She had been trying to

*Continued on page 62*



HAMILTON STD. ADJUSTABLE PITCH PROP. 9' 1" (1.46m) DIAM.  
 NOTE UNSYMMETRICAL TRIM  
 SPAN, 31' 6" (9.6m)  
 L.E.  
 RED, LEFT TIP  
 GREEN, RIGHT TIP  
 LANDING WIRES, REAR ONLY

600 HP PRATT & WHITNEY WASP R-1340 ENGINE.  
 GEAR IN FLIGHT POSITION  
 5' 11" (1.80m)



CONFIGURATION SHOWN AS RESTORED BY FRANK TALLMAN. ENTIRE AIRPLANE FINISHED IN GULF ORANGE. EXCEPT AS NOTED FOR LETTERING, TRIM & SUNBURST ON WINGS & HORIZONTAL SURFACES.  
 SOURCES: - PHOTOS FROM ROGER BAERH, FRANCE.  
 PETER BOWERS, CURTISS-HAWK DRAWINGS & "FLYING THE OLD PLANES" BY FRANK TALLMAN.  
 PETER WESTBURG

JANUARY, 1974  
**CURTISS GULFHAWK IA**  
 SHEET 1 OF 2

ORIGINAL DRAWING	SCALE	SCALE BAR - INCHES	SCALE BAR - METRIC
28 X 40	1/16" SIZE	SCALE BAR - INCHES	SCALE BAR - METRIC - CM x 10

Copies of the original 28 x 40 inch drawings of the Curtiss Gulfhawk IA are available at \$3.00 a set.  
 Order direct from PETER WESTBURG, 834 Seventh St., Santa Monica, California 90403.



Al Williams' personal aerobatic plane, built by Curtiss, and following a crackup, was rebuilt at the expense of Gulf Oil Company, who thenceforth took over sponsorship and named it 'Gulfhawk.' Rebuilt ship had aluminum covered fuselage and fin, low pressure tires, Wright Cyclone engine.

# CURTISS GULFHAWK 1A

By PETER WESTBURG

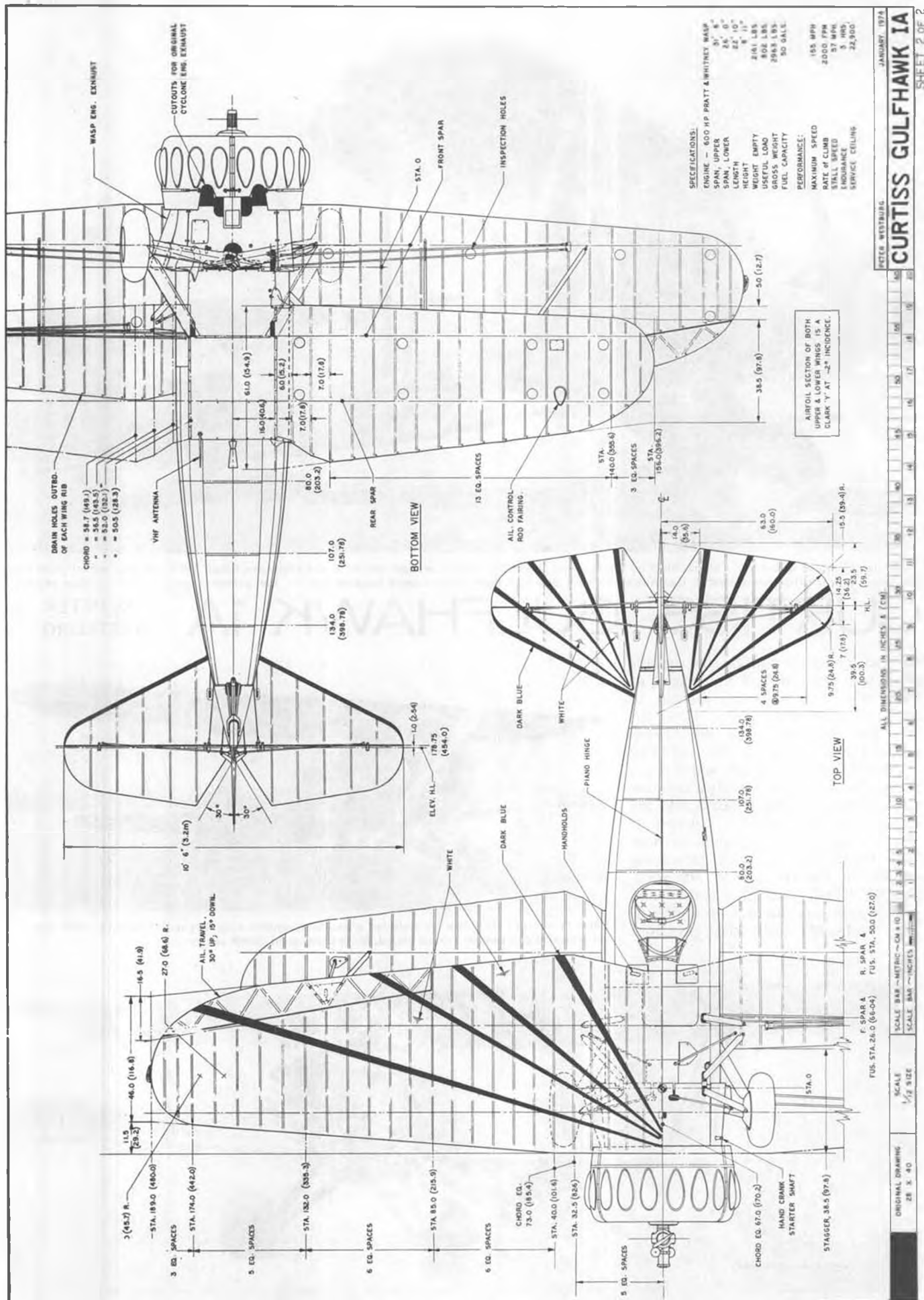
● Researching for data on this airplane was like trying to find the origins of early man. It took seven months to confirm the overall length! Hawk IA was the designation for the Curtiss export Hawk, and it was reported to be a spin-off from the YP-20, which was a P-11, which was a P-6 with a two-row Curtiss Chieftain engine. Basically, the airplane was an F6C-4 . . . almost. It was a hybrid that appeared to have been assembled from spare parts lying around the Curtiss factory. The wide-chord P-1/F6C-1 rudder was used, the landing gear was like that on the P-6A, and it had saddle-bag fuselage gas tanks.



Later revision of Gulfhawk IA included a smaller diameter drag ring with blisters to clear the valve covers and deeper overall chord. Note uncovered shock struts.



Originally known as the Hawk IA, Al Williams' Curtiss was basically an F6C-4 with a P-6 landing gear, fuselage saddle-bag gas tanks, and a Bliss modified Bristol Jupiter, 550 hp engine. Thrilled the spectators at the 1931 National Air Races in Cleveland.



**SPECIFICATIONS:**

ENGINE — 600 HP PRATT & WHITNEY WASP  
 SPAN, UPPER 34' 8"  
 SPAN, LOWER 32' 10"  
 HEIGHT 8' 11"

WEIGHT EMPTY 2161 LBS  
 USEFUL LOAD 802 LBS  
 GROSS WEIGHT 2963 LBS  
 FUEL CAPACITY 50 GALS.

**PERFORMANCE:**

MAXIMUM SPEED 155 MPH  
 RATE OF CLIMB 2000 FPM  
 STILL SPEED 57 MPH  
 ENDURANCE 40:00  
 SERVICE CEILING 22,000

AIRFOIL SECTION OF BOTH UPPER & LOWER WINGS IS A CLARK 'Y' AT -2° INCIDENCE.

PETER WESTBURG  
**CURTISS GULFHAWK IA**  
 JANUARY, 1974  
 SHEET 2 OF 2

Copies of the original 28 x 40 inch drawings of the Curtiss Gulfhawk IA are available at \$3.00 a set. Order direct from PETER WESTBURG, 834 Seventh St., Santa Monica, California 90403.





As restored by Frank Tallman, the Gulfhawk had P & W Wasp and other parts from an SNJ. Note one grooved, one diamond treaded tire.

The powerplant was something else again. Al Williams specified a Bristol Jupiter of 550 hp, reworked by Bliss, and this was the original version, with the registration NR-982V, in which he thrilled crowds at the 1931 National Air Races in Cleveland.

Damaged in a crash, the airplane was rebuilt with a 575 hp Wright Cyclone and an aluminum skinned fuselage and fin. Sponsored by Gulf, it became the "Gulfhawk IA" and was finished in the familiar Gulf orange and dark blue.

Two decades after Williams procured his famous Grumman Gulfhawk II, Frank Tallman ran across the IA in an

*Continued on page 71*

At 1850 rpm, throttle open, the Wasp R-1340 moved the Gulfhawk at 155 mph. A rugged, powerful acrobatic aircraft.



Big cowl and barrel fuselage limited ground visibility. Large tail surfaces great for stunts, but small ailerons made rolling maneuvers a bit mushy.



The proud winner of the BIG one at Bakersfield, Jeff Bertken's first time to take first place in a pylon race couldn't have happened at a more momentous occasion. He proved conclusively that his hands, feet, and judgement are on a par with his ability to talk!

PHOTOS BY JERRY

# pylon

By JERRY SILVERMAN

● Cumulus clouds completely covered the skies 130 miles north of Los Angeles, which was the setting for the 1974 Bakersfield Air Races, hosted by the BARKS, of Bakersfield. Temperatures in the high 60's and low 70's, with the winds steady and quite strong from the northwest, at about 20 knots, meant very little to the 104 entrants who came to participate in this highly prestigious BARKS race. One thing they all had in common was the sincere desire

to say, "I won Bakersfield." I might add at this point that 104 entrants made it the largest Formula I contest that has ever been held anywhere. Not bad for a dying event!

The exact location of the race was Poso Field, at Famoso, 20 miles north of the town of Bakersfield. Located right next to the Famoso drag strip, it is certainly the best racing facility that Southern California has to offer . . . No smog either.



Jeanie Christensen adds a bonus to Johnny Brodbeck's 5th place win. Note that famous beer can hat. Glen Spickler watches technique.



Joe Vartanian, Terry Prather, and Jim Jensen (l to r) all flew Prather Products Little Toni powered with ST X-40's. All went 1:22.0 or better, with Terry setting a new mark of 1:15.7!

Flying there in a Cessna 210, the first thing we noticed was other planes in the distance, their pilots looking for a hole in the clouds through which they could descend to this now famous Poso Air Field (famous at least to Formula I flyers). Private planes were in abundance; a P-51, Midget Mustang, Pitts Special, Cherokee's, Cessna's, all were there. As he does every year, Bob Bleadon delighted the crowd by taking anyone who wanted to up for a ride in his P-51 . . . a ride that will never be forgotten, at least by this reporter. Split S's, rolls, inside loops, Immelman turns, straffing runs . . . whatever is possible with a P-51, Bob will do. Keep in mind it is all done at 350 to 400 knots, and he pulls 3 to 5 G's. I assure



Joe Howard came out of retirement to win first in Standard. Trophy presented by Vicki Boyce. His best time was 1:27.0. NMPRA President Glen Spickler looks up the next winner.



Charlie Shaw (8th), Jeff Bertken (1st), and Bob Smith (3rd) and their Super DARA II's with long wings. Bob logged a 1:16.5 with K&B.

you, you will never forget that.

Paul White, from Kraft Systems, was there with his Midget Mustang, painted exactly like the models he used to fly in Formula 1. I am sure I don't have to remind many of you how well Paul builds, so you can imagine how nice his real Mustang is, as he built it entirely by himself. Several times during the two day meet, I looked up to find Cliff Weirick streaking (*Still a D.O.M., eh? wcn*) around the skies in Paul's Mustang, around 200 MPH.

This year the Bakersfield Air Race was held one month early because of the high temperatures that are usually prevalent during the month of June. Keeping in mind the desires of the flyers, May 18 and 19 was selected by Glen Spickler as the weekend to have the contest.

Social headquarters was the Bakersfield Hilton, and everyone was asked to check in there on Friday night, if they were in town. This was to defray any wasted time on Saturday morning and to allow the race to get started as soon

as possible.

Saturday morning came, not without some difficulty getting to sleep the night before. Things started happening promptly at 0730. Glen Spickler called for all planes to be safety inspected; first the Standard class, then the Experts. As soon as the Standard class was inspected, they were put on the line to be scale judged, and then the Expert planes were inspected, followed by their judging. At 0920, the first race was in the air. Keep in mind, 104 entries were inspected and scale judged, using the AMA method of one to infinity. Kind of proves you don't have to spend 2 or 3 hours getting this task done.

It is quite apparent why this contest is so popular, everything is planned out so well. Nothing is left to chance. In talking to Glen, he says he plans every Formula 1 race one year in advance. It is this kind of thinking that makes the BARKS race so popular. A schedule is formulated, and followed right down to the last minor detail. In short, Glen rules his contest with an iron hand,

blended with tolerance. Make no mistake, the BARKS have a sincere desire to make their contest the best. They certainly do whatever is necessary to achieve that goal. Their workers are highly trained and know what they are doing. Each year they try to out-do the previous year, and this is quite difficult, especially since the entry list gets larger each year.

This year, the light system designed, built and maintained by Jerry Boyce was again used. He is one of the club officers and also a very accomplished Formula 1 flyer . . . that is if he could learn to land the confounded things.

As was done last year, each contestant was given one raffle ticket, and drawings were held during the entire day on Sunday. At the awards ceremony, the big raffle was held for all the flyers. The prize, a new 1974 Kraft radio. The winner was Loretta Hall, our NMPRA Newsletter Editor. That's fantastic, especially after the crash of her prized Formula 1 beauty. *Cont. on page 66*



Ron Neff finished 4th overall with Spickler designed Minnow. Best time was 1:16.5, used new, stock Rev-Up prop . . . bolt on and fly!



Frank Szekula's ship was No. 1 in scale judging. Back after a year in retirement, Frank finished 5th in Standard out of 60 entries.



A pleasant switch from the usual all-white, all-fiberglass supersailplanes, the all-metal Blantik is no less super, but offers a change of building techniques and finishing for the scale soaring modeler. Top Flite's new silver Monokote would be just right . . . if you care to go that way.

# R/C SOARING

By LE GRAY

. . . in which we investigate a unique scale project for those who tire of the string and glue syndrome . . . who find the supersleeks short on personality. In a word or two or three, "Czeck" this one . . . so to speak.

● The Blantik L 13 is one of the most beautiful sailplanes in the air today . . . and one of the most interesting. A large, two-place craft of all metal construction, the L 13 has the classic lines of Yankee simplicity and an appearance of solid integrity not unlike the historic DC-3. But there's one problem with all that American-as-apple-pie stuff; the Blantik L 13 is a Czechoslovakian machine, built by the LET National Aircraft Works. It's exported by OMNIPOL, Ltd.

which handles the sale of all products of the Czechoslovak aircraft industry.

This imported silver bird incorporates enough distinctive features to excite a service station attendant during a gasoline shortage. It is fully aerobatic when flown solo, but limited to the lower stress fundamental aerobatics with a crew of two. Both front and rear panels are completely instrumented, and both may be supplemented for "blind flying" in clouds, which is legal for sailplanes in some countries . . . not in the U.S. The LET factory can deliver the L 13 with pull-down blinds for the rear pilot's compartment for use during instrument instruction sessions. Position lights are an option available to those who might enjoy the serenity of starlight soaring.

The Czechoslovakian design is touted to hold more world soaring records than any other sailplane. The Blantik L 13 has been flown over the Andes from Chile to Argentina. It set an international, multiplace distance record of 527.9 miles, an international multiplace goal record of 436.7 miles, and at least three feminine multiplace world records. The L 13 may also claim the record for greatest number produced. More than 1900 have been built, and the design has seen service in more than 30 countries around the world.

Undoubtedly, the Blantik's popularity in the United States is on the upswing, now that it is certificated. Until 1972 the L 13 was forced to operate in the U.S. under the FAA "Experimental"

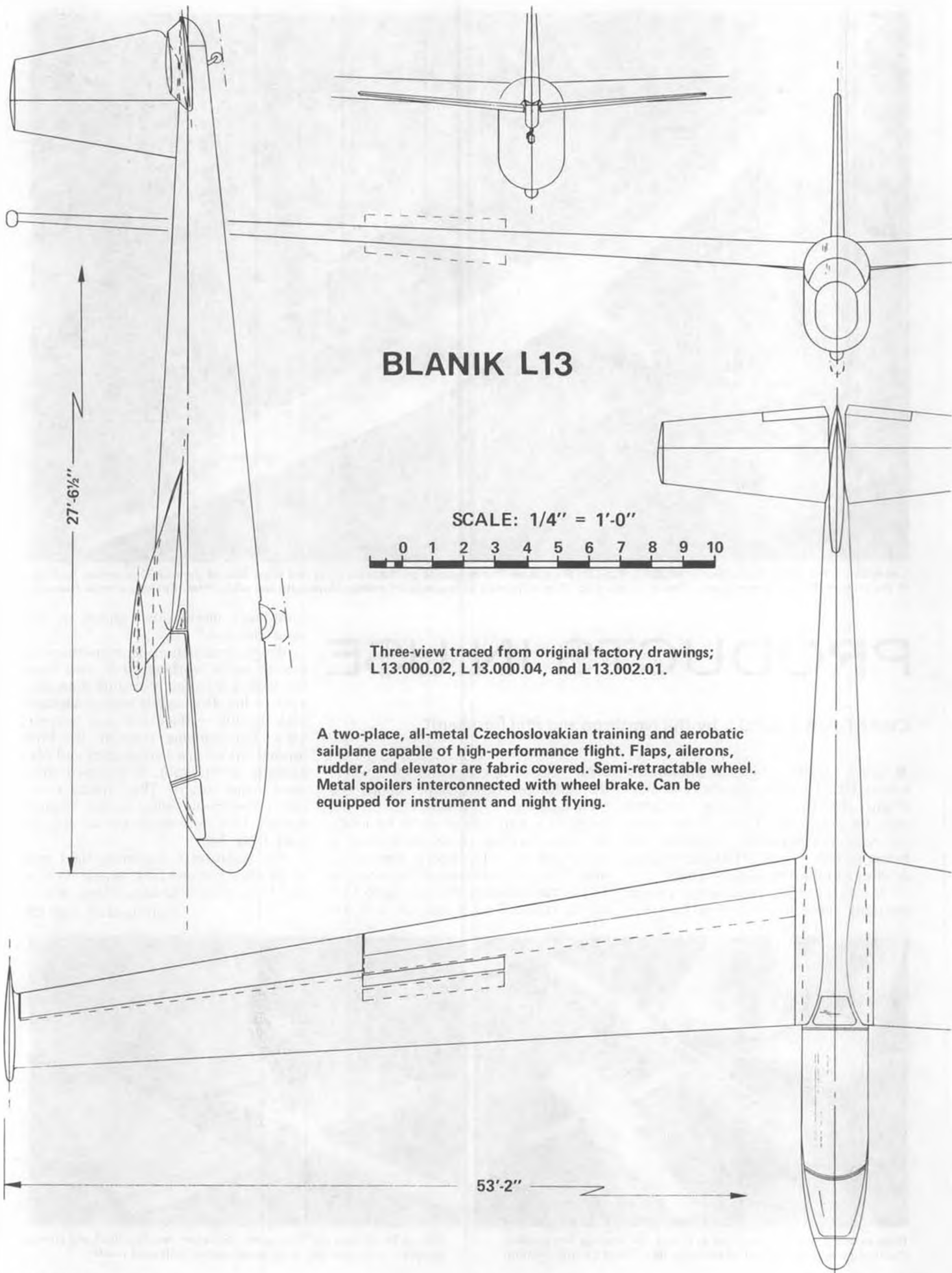
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The scale modeler should jump with joy at the sight of this cockpit photo. Note empty space.

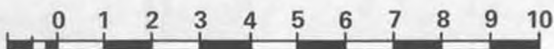


Stabilizer has just enough dihedral to clear the ground when the ship is heeled over. Good thinking! Semi-retracted wheel should simplify modeling problems. Note tip "tanks."



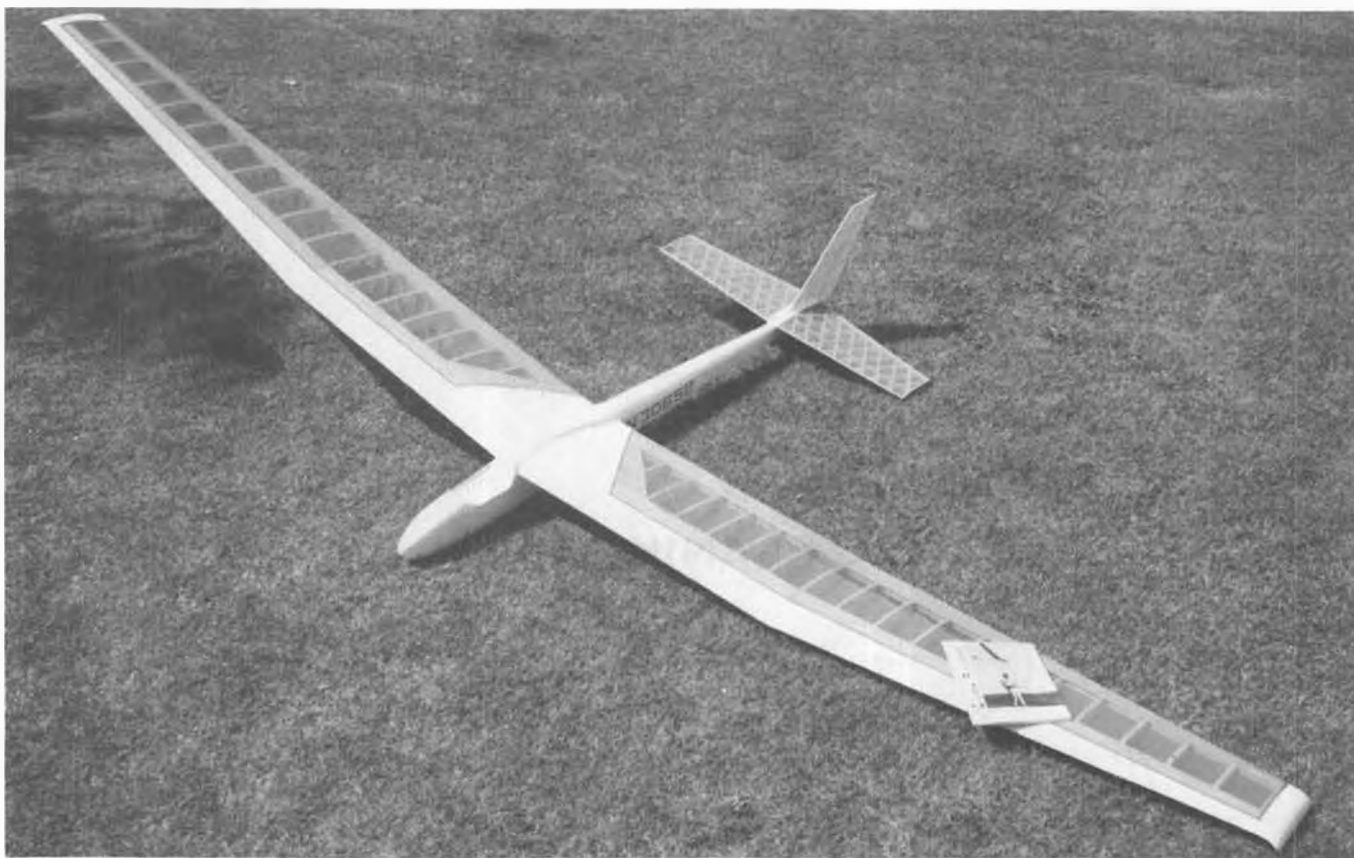
## BLANIK L13

SCALE: 1/4" = 1'-0"



Three-view traced from original factory drawings;  
L13.000.02, L13.000.04, and L13.002.01.

A two-place, all-metal Czechoslovakian training and aerobatic sailplane capable of high-performance flight. Flaps, ailerons, rudder, and elevator are fabric covered. Semi-retractable wheel. Metal spoilers interconnected with wheel brake. Can be equipped for instrument and night flying.



Leo took up the whole front lawn at MODEL BUILDER's office! The magazine on the wing gives you some idea of the size. One person looking at the picture thought the mag was a book of matches! Ship is finished in transparent orange Monokote and white trim. Epoxy paint on fuselage.

## PRODUCTS IN USE

CRAFT-AIR's "LEO," by Bill Northrop and Phil Bernhardt

● Leo is truthfully billed as the world's largest kitted model airplane, and even though the 12 foot, 7 inch span may only be a few silly inches longer than its nearest competitor, certainly the lifting surface area of 2160 square inches eclipses all others by a wide margin.

The two-piece, plug-in wings have a constant chord of 15 inches from the

center out to 2/5 of a half span, where the outer polyhedral joint occurs, and then tapers to 7-1/2 inches at the tip. Weighing a minimum of about 7 pounds, the wing loading comes to a floating low figure of 7-1/2 ounces per square foot. For good penetration, ballasting to 13 pounds increases the loading to 13.4 oz./sq. ft. At 8 or 9 pounds, Leo will

climb well above other gliders in the same chunk of lift.

Wing construction is conventional, though while working on it, you have the feeling that you're smaller than you used to be! The leading edge is sheeted back to the webbed top and bottom spars. For supreme strength, the box formed by the hardwood spars and ply webbing at the root, is wrapped with sheet metal straps. This structure receives the maple wing tongue, which doesn't look too much unlike a bent pool table leg.

The stabilizer is extremely light and of geodetic construction, appearing like two long, skinny baskets. Many, many

*Continued on page 69*



Huge maple tongue is imbedded in removable fuselage top section. Pushrod dowels are spliced. Radio area like Grand Central Station!



Plug-in flying stab on 'Leo' spans 36 inches, features light and strong geodetic construction. Note aerodynamic balanced rudder.



One thing about the 'Tub', it's no trouble replacing the rubber motor! Author uses styrofoam parts to keep weight down.

## RAMSEY FLYING 'BATHTUB'

By DON DRURY . . . Here's a bonus Peanut for all them hungry elephants out there! As flying fields and balsa get more scarce and/or costly, the little 13 inchers continue to grow . . . in volume, if not size.

● W.H. Ramsey designed this unusual home built in 1931 and, although it flew very well, the records show that only one was ever constructed. The plane's unusual features included the bathtub type of cabin, seating two side by side, and the Aeronca 30 horse power, two cylinder engine. Complete history, three-view drawings, and details, were published in the June-July

1963 issue of Air Progress.

This little gem is an ideal rubber scale model due to the high thrust line, related wing and tail size, and general moments. Also the combination of open framework and tub gives added eye-appeal and takes the model out of the norm. The amount of scale detail is up to the individual modeler and the level of competition in your area. Two mod-

els were built, one indoor light-weight with condenser paper covering, and one heavier outdoor version with colored tissue and paint trim. Both models were photographed, but the plans are for the light weight version.

Construction is conventional and quite simple. The bath tub is 1/20 sq., or 1/16 x 1/32 sliced from light weight 1/32 sheet. Formers are 1/32 sheet and deck stringers are 1/32 sq. Nose of the tub is light weight styrofoam. Landing gear is 1/64 wire and wheels are, again, light weight styrofoam.

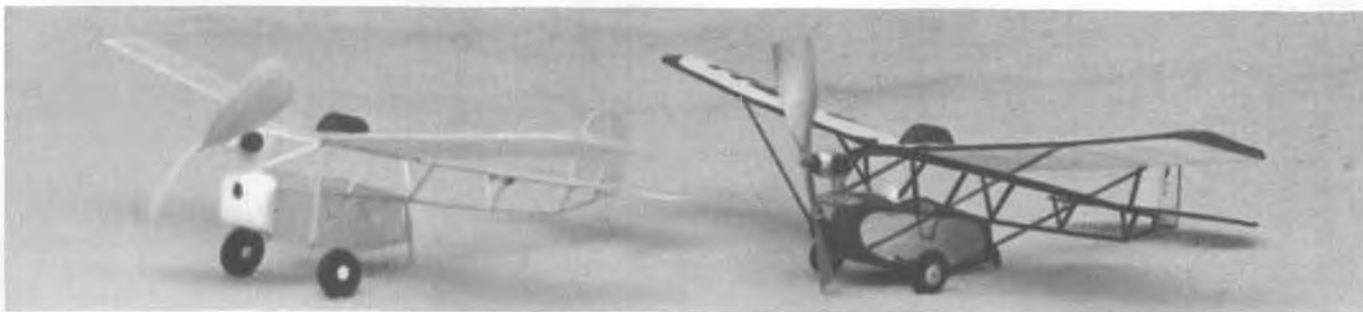
The engine is a tube of 1/32 sheet balsa soaked and wrapped around a pencil. The engine pylon is a sandwich of three 1/16 sheets, and the center piece is cut into the foam nose of the tub. Add 1/16 engine nose plate and thrust button and install tail skid and styrofoam cylinder heads. Cover with condenser paper and tub is completed.

The propeller is made from 1/32

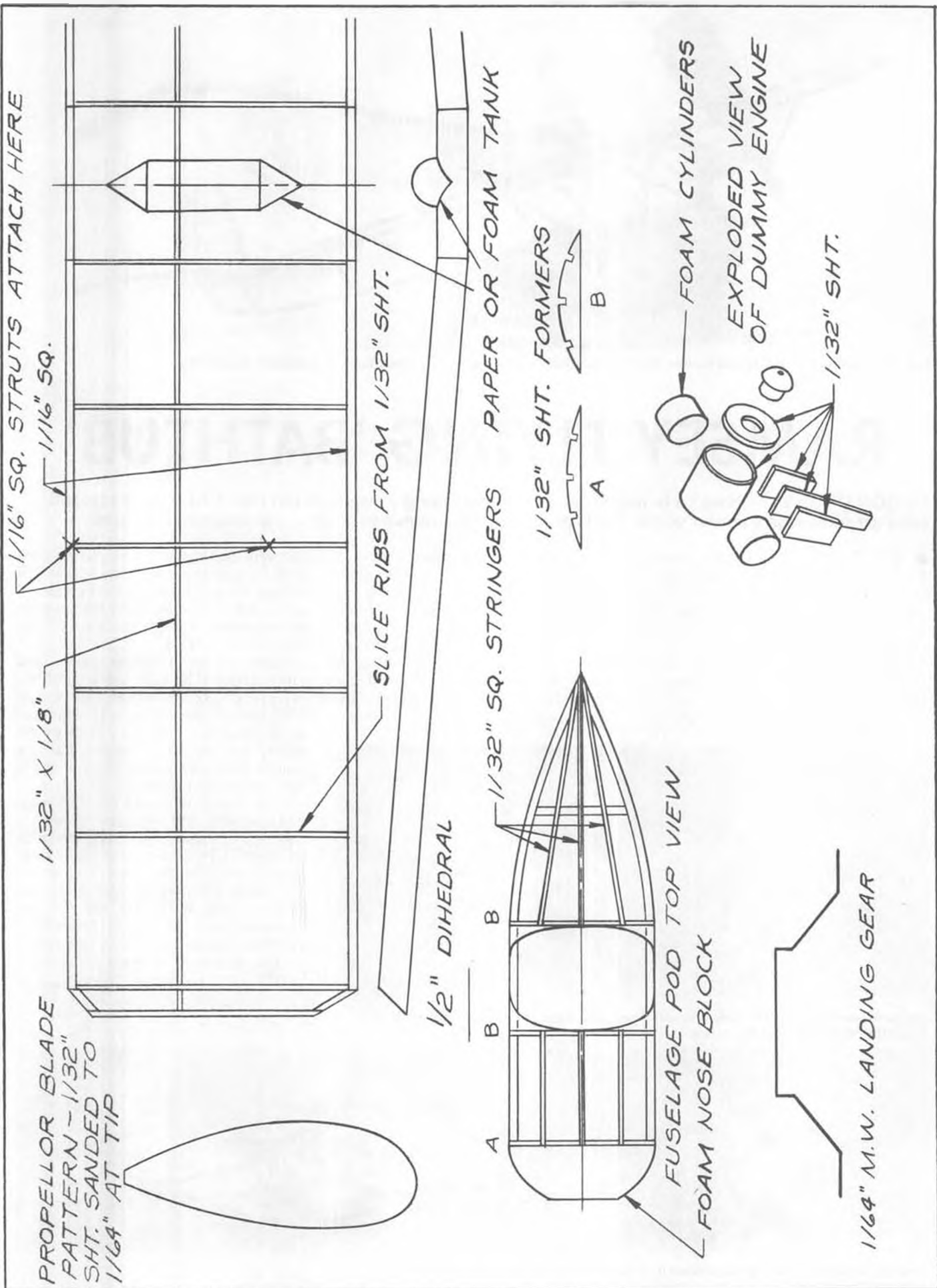
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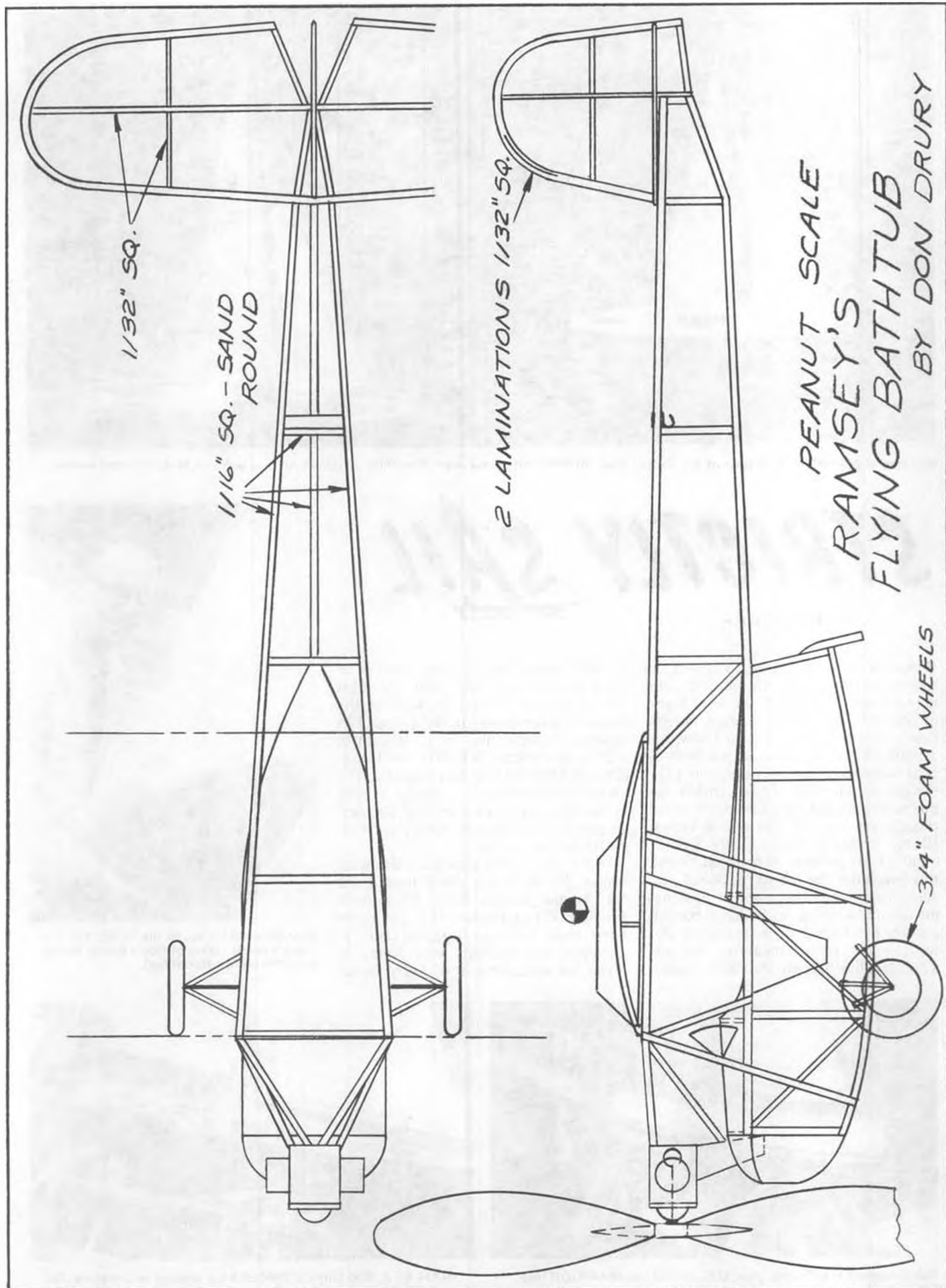
The condenser paper covered indoor model almost disappears into the background. High thrust line allows generous size propeller.

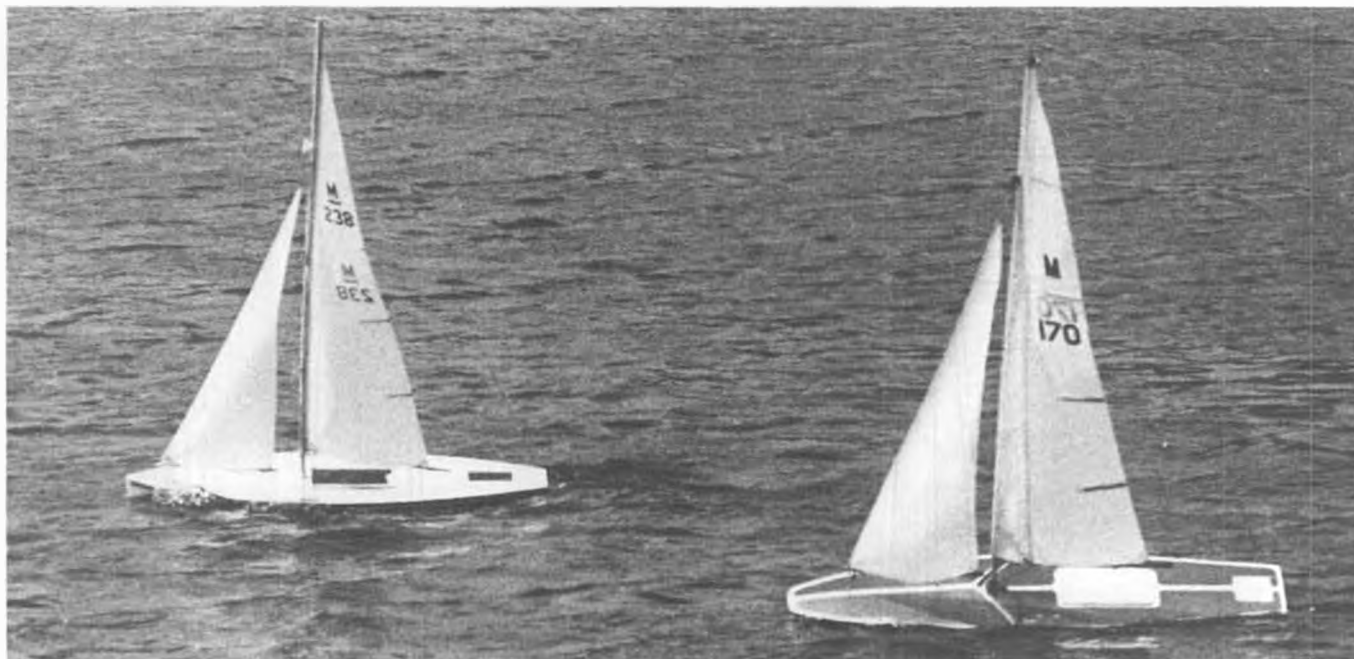


Most of the difference in the two models is in the wood sizes used in construction.









Bob Harris' WARRIOR II, winner of the Garden State 50/800 Invitational, leads Roy Pitts' AQUAPLANE to weather. Note different wakes.

# STRICTLY SAIL

By ROD CARR

● Rather than get bogged down in too much technical information, let's take a look at some of the new breed of 50/800's that have hit the competition trail this season. As you know, the 50/800, or Marblehead class, is a formula boat with basic controls only on LOA (length overall) of 50±0.5 inches for the monohull, and a maximum measured triangle sail area of 800 square inches. Jibstay height is allowed only a maximum of 80 percent of mainsail height; this precludes the use of masthead jibs. Also, roach measurements of 2 inches maximum with 4 inch long battens control the amount of unmeasured area we can add to the measured triangle. This class has become the most popular

in AMYA due to the large number of good designs published over the years for vane-sailed boats, as well as the recent introduction of hulls and kits developed specifically for radio control such as the Vortex SOLING, the Littlejohn BOOMERANG, and recently, the Victor "VALKYRIE". I would expect to see M-class boats carrying 500 series numbers sailing long before the middle of the '74 season.

April 28th of this spring, the Delaware Valley Model Yacht Club hosted the 1st Annual Garden State Invitational for 50/800's at Pitman, N.J. . Skippers from New York to Virginia came to compete, and we were very happy to make the acquaintance of Larry Good-



Roy Pitts and his aquaplane "LIMEY." The name a combination of Roy's British accent and lime-green color of hull.



Bob Schumacher of Washington, D.C. piloted this WARRIOR into 6th place. Note the scimitar-like "radial" booms.



ROOT 66 . . Rod Carr's BOOMERANG finished in 2nd place. Still has teething troubles, but skipper is suspected as main problem.



Larry Goodrich tries to figure out what to wind up next on his 4th place own-design.



Goodrich's hull had powerful sections and reveled in the stronger gusts.

rich, who is an AMYA member, as well as serving as National Secretary of MYRAA, our vane-sailing counterpart. Wind and weather couldn't have been better, and the course allowed a very long leg to weather which pleased all the skippers, since pointing and tacking ability soon separated the boats on the weather mark. Eighteen heats were sailed, with each skipper sailing in 9, and getting the chance to compete with everyone except those with whom he shared a frequency. When the smoke of battle cleared, Bob Harris, AMYA presidential nominee, showed us all by taking home first place honors with finishes of 1-1-1-1-1-2-2-2. Next in line was this columnist with a 1-1-1-1-1-2-2-4, for a total point separation of only 2 points over the course of the entire day. Having monopolized the first place finishes, the rest of the pack came up with some very close scores as they divided 2nds, 3rds and 4ths during the afternoon.

Of interest are the vessels sailed by the leading scorers, as well as some of the other occurrences and vessels with which we shared the water. Our lead photo shows the winning boat, No. 238, leading No. 170 up the windward leg. Harris' vessel is a stock WARRIOR II

with 2 Oz. Dacron sails from my loft. The hull is available from Black's Boat Accessories, 4761 Niagara Ave., San Diego, Ca. 92107. There are two basic reasons for the success of the WARRIOR in this competition. First, the boat is now entering it's second year in active racing, having been worked over last year in our local fleet regattas as well as the Paris, Ill. Invitational . . . Tuning takes time, and is well worth the effort. Secondly, the hull form is very longitudinally stable, and runs like it is on rails. The displacement of 19-20 pounds makes her relatively slow to accelerate, so one should contrive to stay out of tacking duels, and sail his own race. As you can see from the photo, the WARRIOR does throw a hefty bow wave.

The No. 170 boat, called an Aquaplane, was built by Roy Pitts of the DVMYC. She is very much like a full-sized scow, and needs to be sailed well heeled to reduce her wetted surface and cut down on drag. Though finishing well down in the fleet, 170 showed bursts of speed to weather that surpassed anyboat sailing. Rapid sail trim and well pulling sails are a requisite for this boat, as she has no momentum or coastability when the wind stops. As Roy tunes her up, I



Chet Purdy designed YANKEE. Third generation vessel from this new American design.

think we can all worry. Plans for this boat are available from "that English model boating magazine."

The underbody of the WARRIOR can be seen in the photo of Bob Schumacher's version of the beast. His boat sports the "radial booms" so popular in California. These are an attempt

*Continued on page 63*



New HUSON 36 prototype fits AMYA's 36/600 Formula class, and almost fits in your hip pocket!



Jim West's sneaky method of sailing to windward really snowed the troops. Gets better mileage out of your sails, too!



"All right, who threw all those Peanuts on the floor?" Line up of 'teen inch scale models for contest held by the Glastonbury (Conn.) Modelers, whose primary concern is keeping rubber scale alive. Looks to us like they're gaining!

## FREE FLIGHT SCALE

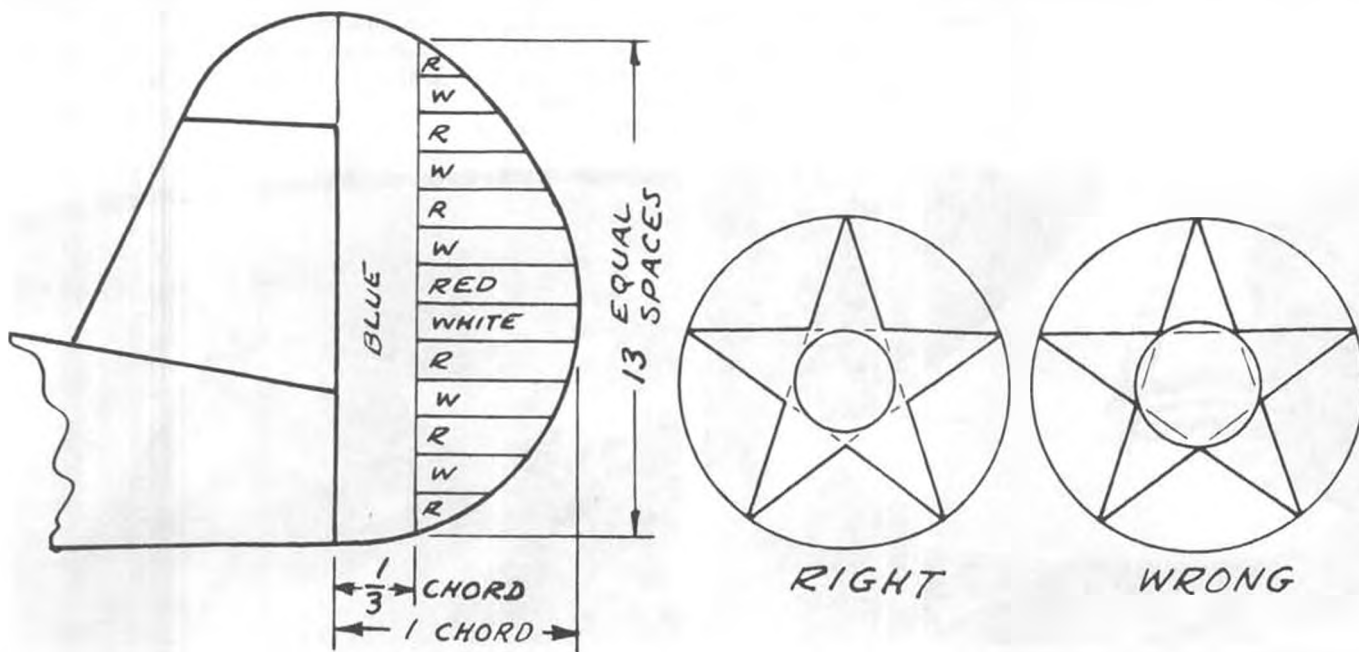
By FERNANDO RAMOS

● It gives me great pleasure to announce the winner of the National Free Flight Society Scale F/F Model of the Year award. The 1974 award goes to Jack McCracken for his superb model of the Sopwith Triplane. This D.C. Dart powered model won F/F scale at the '73 Nats last summer, and is now on display at the Russ-Craft Model Museum in San Marcos, California. It was featured on the cover of the Oct. 1973

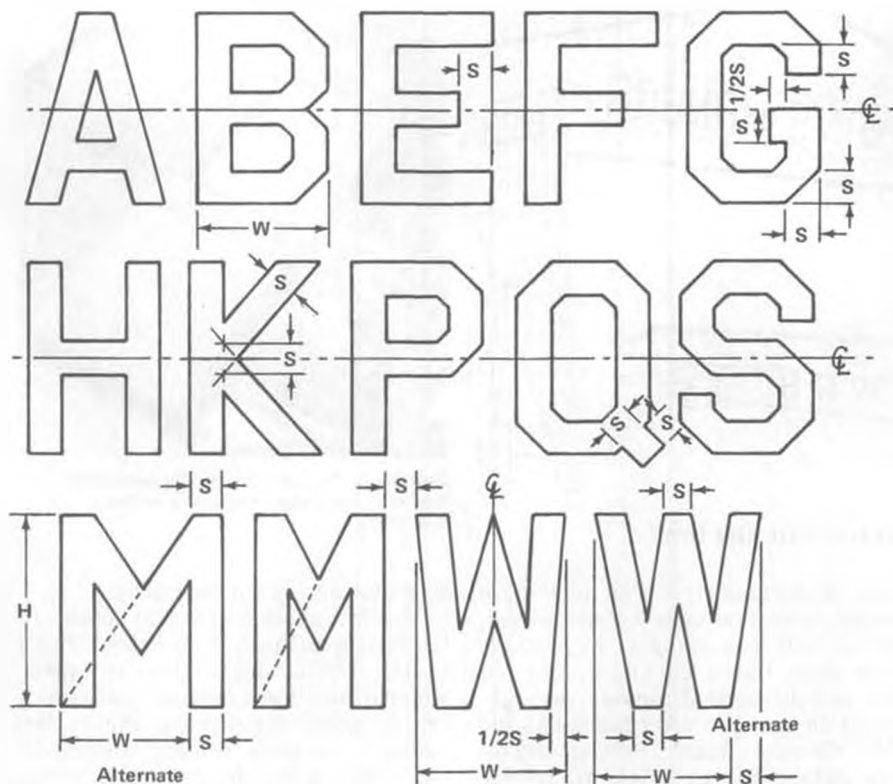
issue of MODEL BUILDER Magazine. This marks the fifth consecutive Model of the Year awards. Most of the recipients of the other F/F categories will display and discuss their winning models during the NFFS Symposium, to be held at the Nats this August. Drawings, photos, and stories about the models will appear in the NFFS Symposium Report, which will be available for sale at the Nats or by mail

order through the NFFS.

Now that I am knee-deep in the building of wing panels on my full-size biplane, there are a few products I have used that can be easily incorporated into modeling. The first, is aircraft plywood. I have never seen this material prior to using it on my wings. The most obvious advantage is its weight . . . or lack of same! It is extremely light compared to the plywood that is



Correct proportions for early Army Air Corps stars and stripes are very often overlooked when trimming scale models. Keep this reference chart.



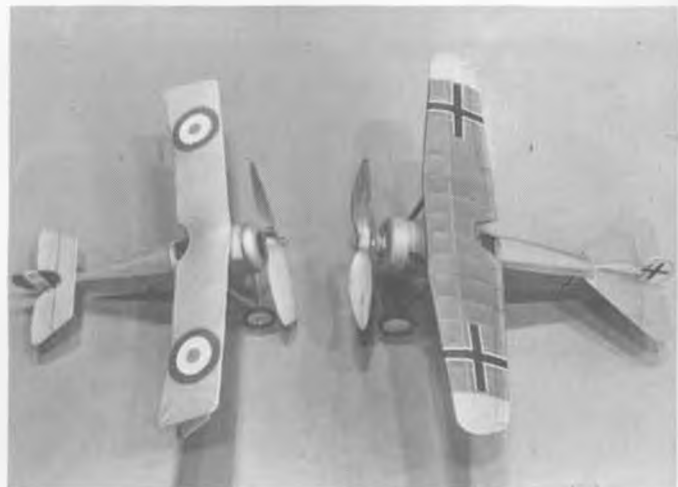
Correct proportions for registration lettering, where H = letter height, W = 2/3 H, and S = 1/6 H.

commonly used by modelers. The only drawback is its cost, however, small odds and ends can be purchased quite reasonably from aircraft suppliers. By using this material in lieu of the "standard" modeling plywood, you will note how much lighter your model will be without sacrificing strength.

Another product is a glue called Aerolite 306. This is the type of glue I have been using on my wings, and I have found that it is ideally suited for modeling purposes. Aerolite is widely used in industry for making furniture, veneering, and for the bonding of wood particles in making chipboard. It is quite popular with "homebuilders," but not only for its strength . . . it can also be used at 60° F. with no problems at all. Aerolite comes in powder form and



George Armstead's Handley-Page O/400. Made short, stable flights. Hedda Hopper topper!



At Glastonbury, John Hodgkin's Nieuport and Ed Morrison's Fokker D VIII square off before WW I duel.



Joel Toner and his record breaking helicopter. Flights of over 6 minutes made the mark.

is mixed with water. It requires a hardener or catalyst, much like epoxy. The chemical mechanism of this glue is sort of interesting. When it is mixed with water it is slightly alkaline. It becomes acid when the hardner is added and polymerization begins to take place. The result is that the viscosity of the glue increases to a rubbery solid, then after a short time, a hard glue.

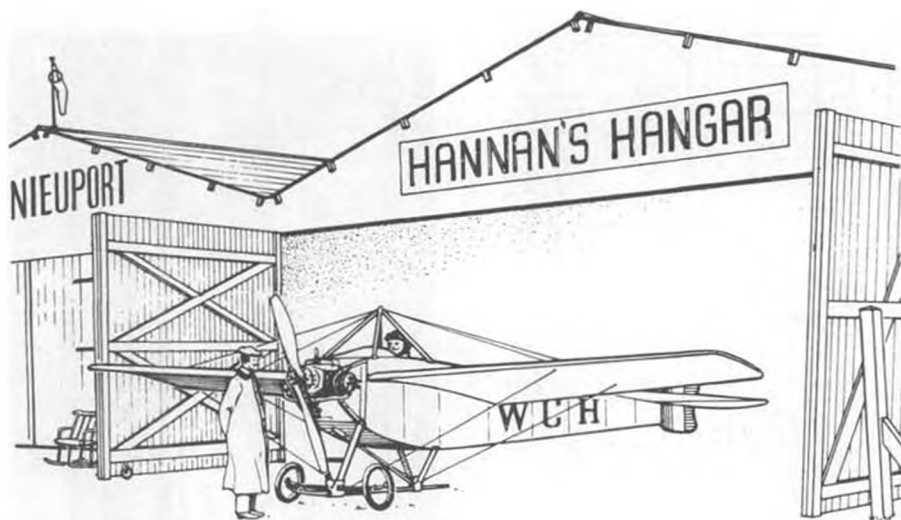
Aerolite is ideal for laminating, gluing large sheets of balsawood, doublers, etc., and not too much clamping pressure is required. I personally feel that it is much better than epoxy for similar applications, except where metal is involved. This is strictly a glue for woods! The cost is considerably less than a comparable amount of epoxy.

How often have you tried drawing up registration letters but found you didn't know how to lay them out? Well, there is a system. The chart shown was

*Continued on page 61*



Big WW I duel. Ten planes launched at one time. Last one down the winner. Fred Hall (foreground) easy victor with 90 secs. on DH-6.



... You're sure Orville and Wilbur started out like this?

#### THE PEANUT POSITION

● Our mail has contained a great many questions relating to Peanut Scale over the past few months, and surprisingly, much of it has originated from outside the United States. With the material and flying site shortages virtually universal, it seems that small flying scale models are gaining fresh attention. Perhaps the most clear-cut distinction that has occurred, is the fact that Peanuts have been regarded primarily as indoor models in some localities, whereas they have long been considered outdoor flyers by the originators of the event. Here in California, where the weather is generally mild, the majority of the Peanut enthusiasts fly their craft both indoors and outside, but owing to the frequency of outdoor contests, the accent has leaned toward the more rugged examples.

Although the original Peanut Scale rules were intended for outdoor events by the Connecticut Flying Aces Club, which conceived them, the rules somehow ended up in the indoor section of the AMA rule book, and the event has been regarded by many as ONLY an indoor event . . . especially since the Nationals have been conducted on that

basis. Unfortunately, the rules have created more than a few controversies, and at last, something is being done about them. Cathy and Charlie Learoyd have bravely stepped forward, and submitted an entirely new proposal to the AMA Contest Board, dealing strictly with indoor Peanut Scale. Watch for this proposal to be printed, and be prepared to offer constructive opinions. Meanwhile, it has been decided to conduct both an indoor and outdoor Peanut Scale event at this year's Nats, so perhaps both factions will have a chance

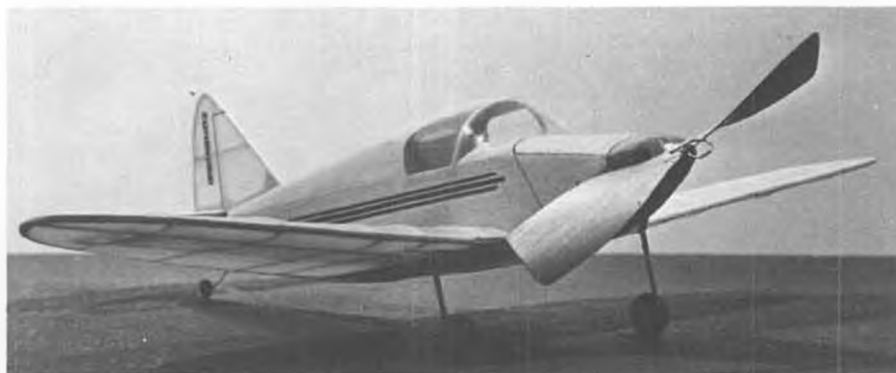


Small sampling of early model aeroplane books in the collection of the author. See text.

to demonstrate their potentials.

Another development that appears to be gaining momentum, is Peanut Postal Flying. Unlike regular postal events, wherein duration times are mailed to a central point for scoring, the Peanut variation involves mailing the model itself to a given site for proxy flying. The concept has already been tested to a limited extent, and appears to be quite feasible, and best of all, inexpensive. Since the models are so small and light, postal or United Parcel charges

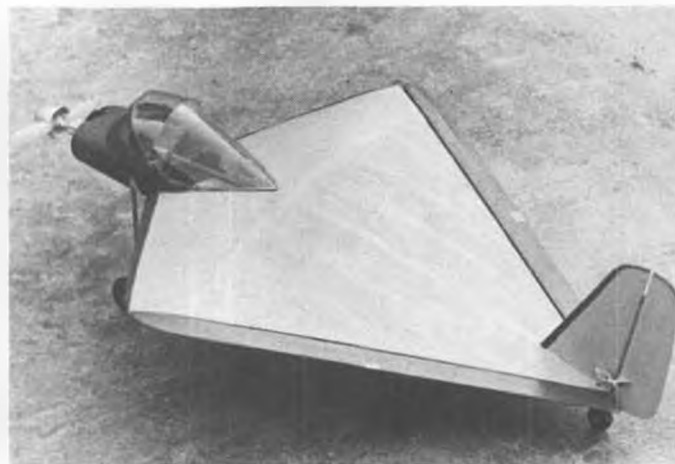
*Continued on page 50*



Culver Cadet constructed and photographed by Bill Caldwell, Dallas, Texas. A peanut scale, of course.



Hard working CD, Jim Bennett, at indoor scale meet in Missouri, checking over documentation. Photo by Lloyd Wood.



Unusual .020 Cox powered F/F flying wing by Don Williams, used for experiments in very low aspect ratio platforms.



# PEANUT WITTMAN VW RACER

By WALT MOONEY . . . Racing pilot/designer/builder Steve Wittman must have had modelers in mind whenever he dreamed up one of his famous racers. The lines are always clean, simple, and easy to reproduce.

● To anyone who has even the slightest interest in aviation, Steve Wittman needs no introduction. This racing pilot from Oshkosh, Wisconsin, has been building winning racers for more than forty years, and is still piloting them in races wherever a race is promoted. His designs are famous for being light, simple, and fast. They are also famous because they have not followed the "french curve" smoothness approach to aerodynamic efficiency. Thus, his airplanes have not always looked fast, but they have always been fast.

This VW powered racer is in the best tradition. It is a boxy, angular airplane. Nevertheless, looked at carefully it is streamlined in all the right places, has been simply built, and is obviously

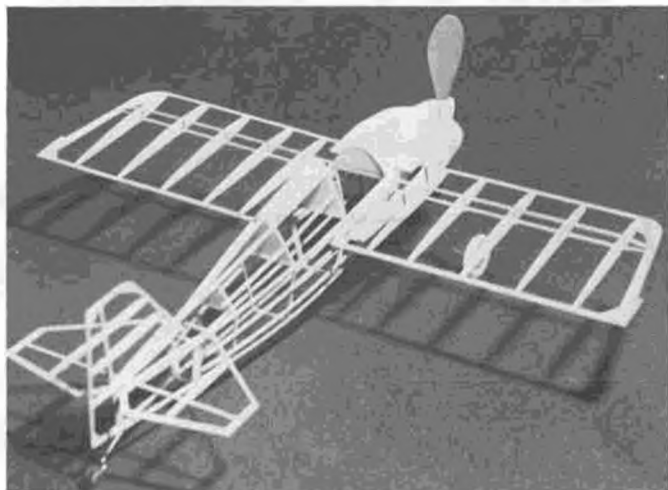
light in weight. One design approach Steve has used for years, is the wire-braced wing. By using wire bracing, the wing can be made much lighter and thinner. Keeping a racer as light as possible is important, because a considerable portion of the drag of any airplane is induced by the amount of lift developed to hold the airplane up and the lower the weight the more quickly the airplane will accelerate, both on the initial takeoff, and after each pylon turn.

There are two intentional deviations from scale in the model; the area of the horizontal tail has been increased slightly, and the dihedral has been increased from nothing to an eighth of an inch. The wing has been designed to use

*Continued on page 55*



As usual, those low aspect ratio wings are a great way to get area in a 13 inch peanut!

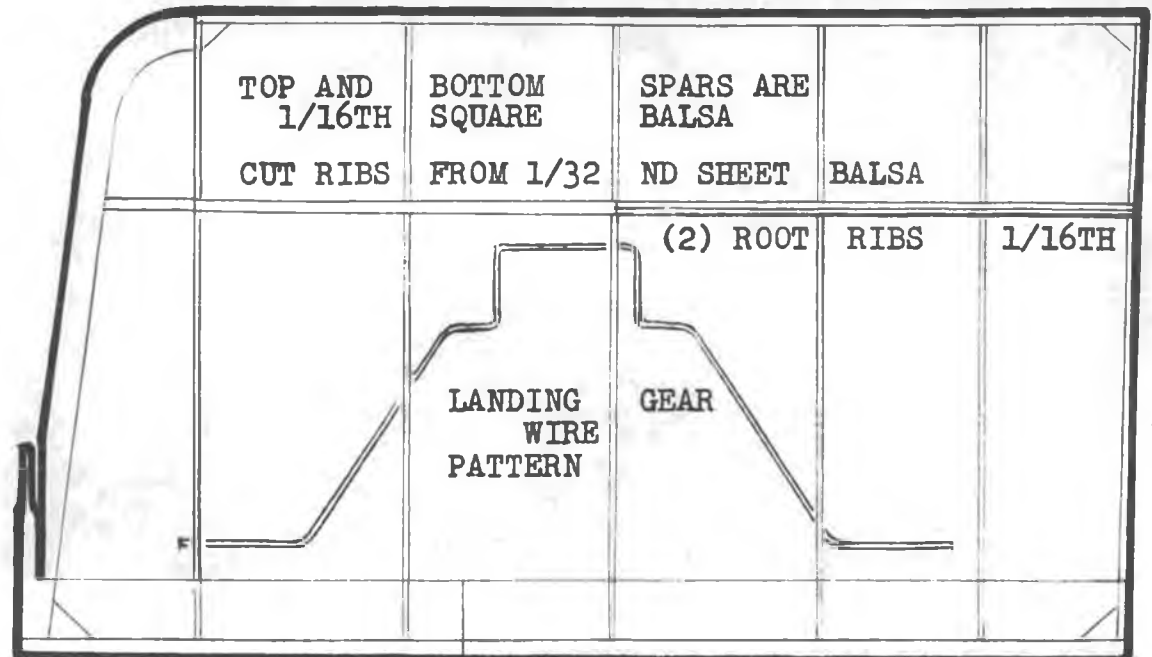


Framework shot reveals the simple construction of the VW racer. Only problem may be the sheeting around the cowl.

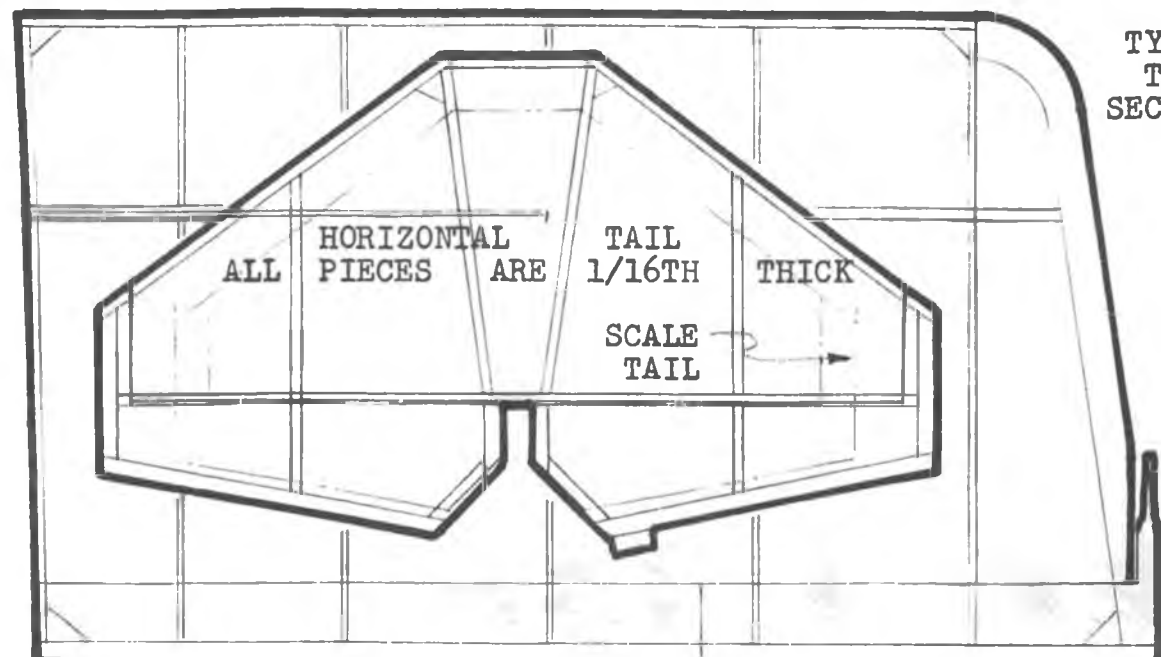


Only deviations from scale are a slight increase in stab area and an 1/8th inch of dihedral added to the otherwise flat wing.

MAKE THE LEADING EDGES FROM 1/16 BY 3/32 BALSA OR FROM 1/16TH DIAMETER BIRCH DOWEL MAKE TIPS FROM 1/16TH SHEET BALSA

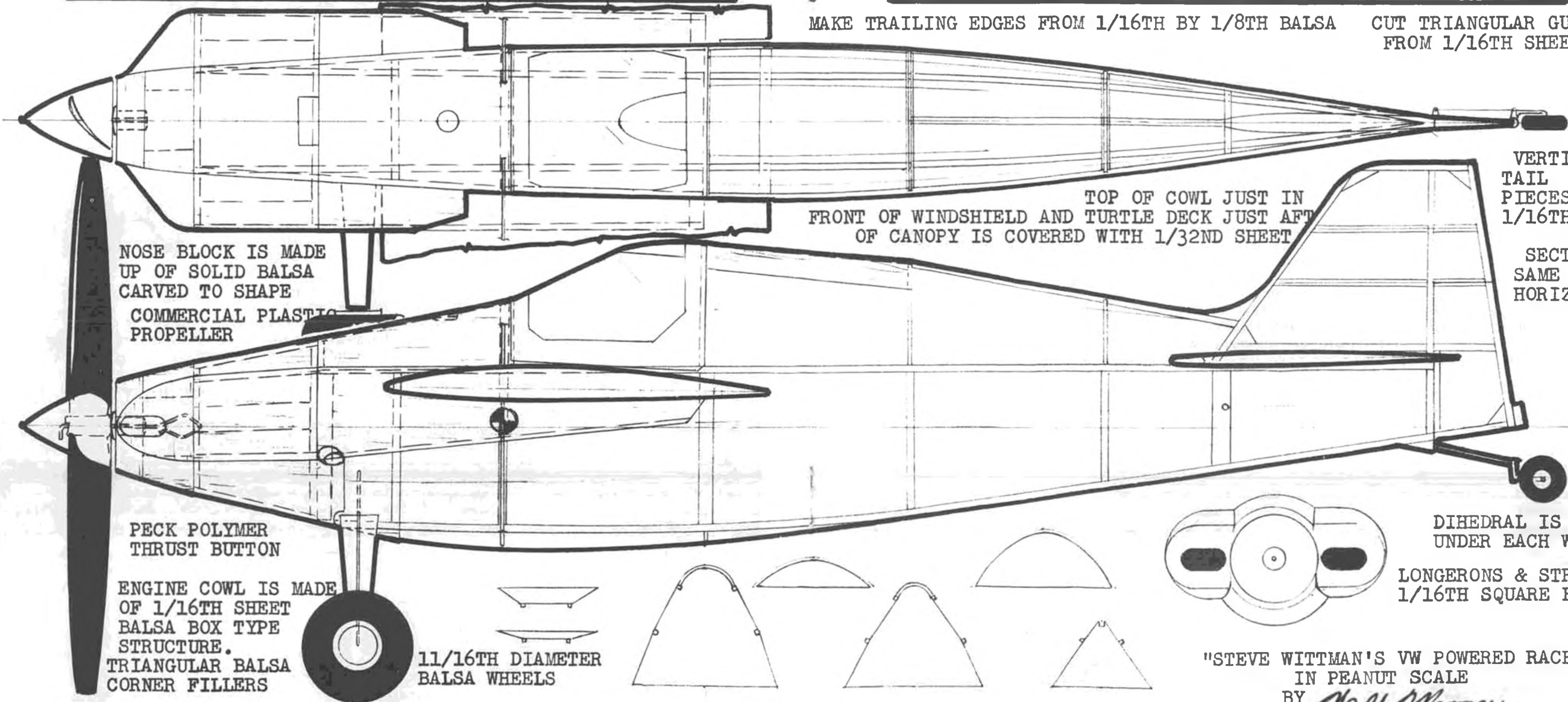


WING RIB



TYPICAL TAIL SECTION

MAKE TRAILING EDGES FROM 1/16TH BY 1/8TH BALSA CUT TRIANGULAR GUSSETS FROM 1/16TH SHEET



NOSE BLOCK IS MADE UP OF SOLID BALS CARVED TO SHAPE COMMERCIAL PLASTIC PROPELLER

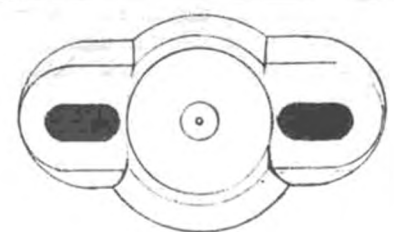
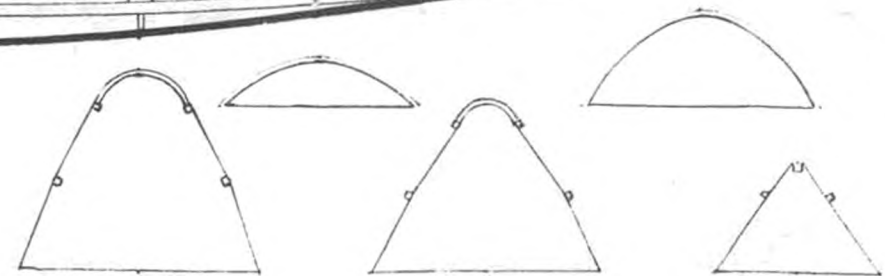
TOP OF COWL JUST IN FRONT OF WINDSHIELD AND TURTLE DECK JUST AFT OF CANOPY IS COVERED WITH 1/32ND SHEET

VERTICAL TAIL ALL PIECES ARE 1/16TH THICK SECTION SAME AS HORIZONTAL

PECK POLYMER THRUST BUTTON

ENGINE COWL IS MADE OF 1/16TH SHEET BALS BOX TYPE STRUCTURE. TRIANGULAR BALS CORNER FILLERS

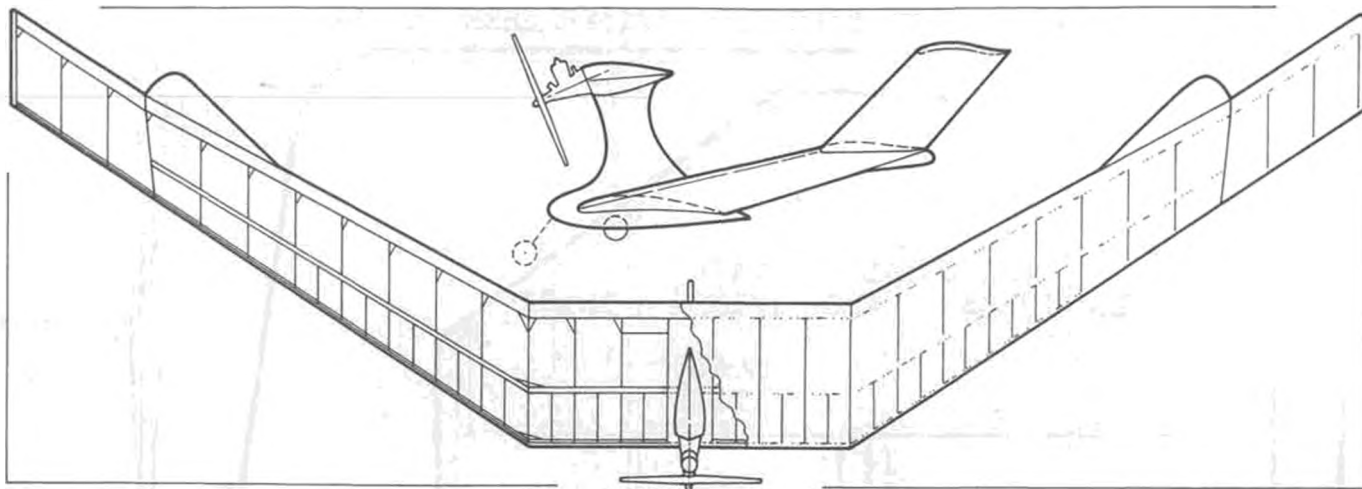
1/16TH DIAMETER BALS WHEELS



DIHEDRAL IS 1/8" UNDER EACH WINGTIP LONGERONS & STRINGERS 1/16TH SQUARE BALS

"STEVE WITTMAN'S VW POWERED RACER" IN PEANUT SCALE BY *Nalt Mooney*





JULY'S MYSTERY MODEL

# FREE FLIGHT

By BOB STALICK

● It's July!! That means that the flying season is upon us . . . hot and heavy. And even more so if you live in the Midwest, the South, California . . . in fact, almost anywhere except the Northwest, where it has been the wettest and windiest Spring in recent years. Lousy weather for testing, contesting, or picture taking.

So, with the good weather hopefully upon us, and some building still staring us in the face, I looked around and tried to find a good looking, simple-to-build, no-nonsense 1/2A ship that would do the trick on the contest circuit.

Sure enough, there it was in an old issue of Free Flight News . . . The Kazoo . . . About 200 Squares . . . Slab sider . . . looks hotter than a greased owl.

So, rather than keep it to myself,

I thought it would make a good feature 3-view for this month's MODEL BUILDER. The designer, Phil Ireland, has a few words to say about it. Speak Phil.

"This model is very simple, with no gadgetry to go wrong and only suction feed to the motor. The airfoils are my own concoctions and give a quite reasonable glide. The most important feature is certainly the low weight. This was considered *essential* and was intended to give the following benefits:

1. Very fast, near vertical climb, plus decent transition without gadgets, and a tight glide circle to damp out stall.
2. Ability to use the weakest lift, and the glide sufficient for three minutes in "dead air" with the airfoils used.
3. Bounceability for trimming.

"The original weight was well under 5-1/2 ounces, but arguments with a radio model added just under 1/2 ounce

in repairs for the Nationals.

"The wing has 3/32 inch wash-in on the right hand inner panel, the left hand inner panel is flat, and there is only 1/16 wash-out at each tip. Wing incidence to thrustline at pylon is plus 3/32 inch. Tail incidence to thrustline is governed by my method of trimming. With C.G. at 105% (ie: behind the T.E.), 3/32 inch packing was put under the stab T.E., and some 1/8 x 1/4 packing on the side of the fin.

"I am no engine tuning expert, but having listened to others on the subject, it was decided that the T.D. .049 or .051, as supplied, might be improved. The barrel is taper-bored, being tighter at the top, so this and the piston were removed from the engine. With these two components clean and dry, the piston was pushed up the bore until the beginning of tightness was felt. One



Dan Sobala is still around. Holding Stratostreak with Cox .020 for OT Replica or 1/2A gas. An altitude grabber. Arland photo.

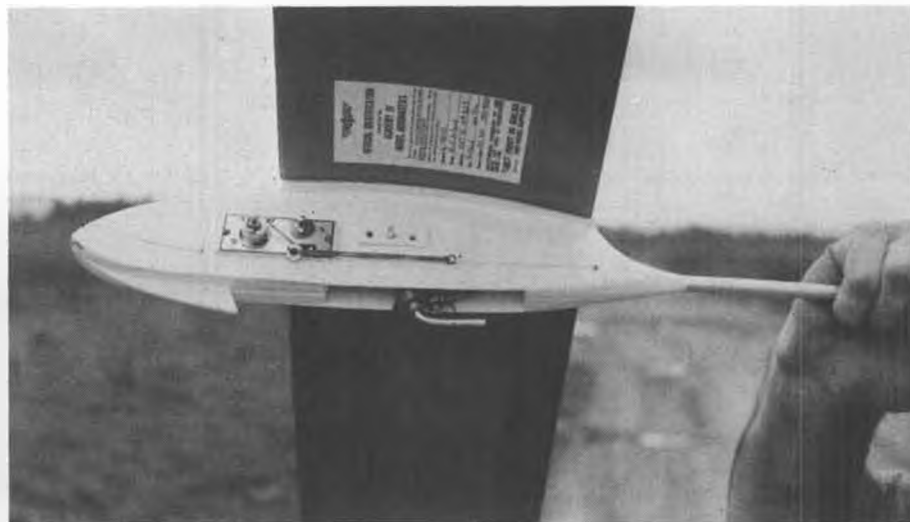


Dennis Rauschert flies his Mathis designed Rambunctious . . . or Hysteria in Class A with nitro-burning Rossi .15. Arland photo.



Ron Davis and his still air A/2 compared to Rick Arland's standard size Osprey. Arland photo (musta used mirrors).

drop of "Brasso" was then added and the piston worked up and down from this point to the top of the bore several times. The components were then cleaned and dried and the fits tried again. The whole process was repeated until, with the piston just held in the top of the bore, it would fall gently out under its own weight with the slightest touch. The reassembled engine would



Russian towhook design as interpreted by Rick Arland, and used on his Osprey A/2. Aluminum arrow shaft fuselage. Arland photo.

then turn 22,000 rpm on a balanced 5-1/2 x 3 Tornado prop., with 40% Nitromethane fuel."

Well, it looks hot to me, Phil. But for those of us who don't want to mess with the engines, there are some other things which we can do. One is to write to Dale Kirn of Kirn-Kraft, and purchase some of his goodies which help our Cox mills do a better job in turning out the rpm's. The other is to send the recalcitrant engine to a hop-up artist.

I have received some sample work

from Scott Newkirk on just this point. Scott works over Tee Dee's until they really move out. The basic modifications which Scott builds into his engines are porting, balancing, and polishing. The engines run extremely well, and 22,500 is not at all out of the question. In fact, Scott recommends this rpm as a good target to aim for in propping the engine, as this is the best place on the power curve to obtain the most amount of power from the Series 74 Cox engines.

The cost for this modification is  
*Continued on page 58*  
*Three-view on next page.*

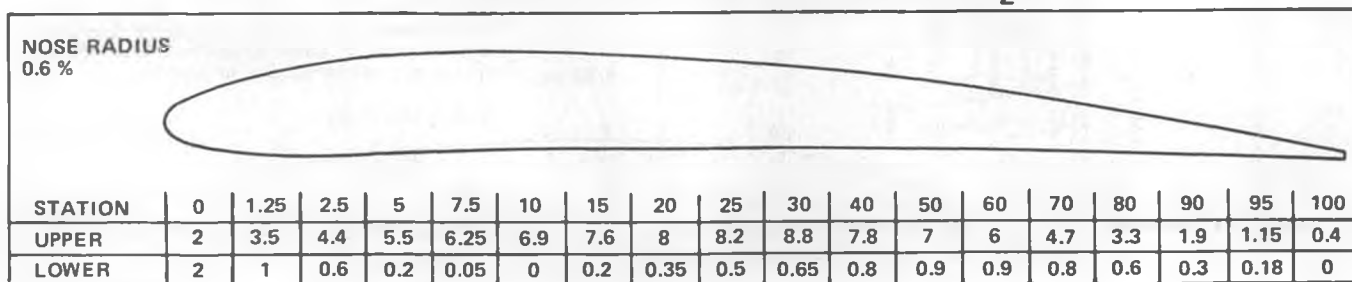


Phil McCrary, Beverly Hills, Ca., and his O.T. "Smoothie", designed by Henry Cole. Phil is one of those immaculate builders who makes you hate yourself . . . unless you build that way too!



Bill McDow launches hi O.D. Honcho 1/2A. Ship landed in rain-soaked tree.

### DARNED GOOD AIRFOILS - BENEDEK B-8353. b<sub>2</sub>



# The KAZOO By Phil Ireland

1971 1/2A Power Nationals Winner

No down or side thrust

C.G. at 105%

1-5/8

2-1/2

3/32 Sheet fin

3-3/8

3-1/2

3-13/32

19

3-3/4

3

1-1/8

Cox Tee-Dee .051 Power  
5 1/2 Dia., 3 Pitch Tornado prop

All-up weight: 5-1/2 ounces

SCALE - 1:6

DIHEDRAL DETAIL

3-1/2

3-1/2

12

Flat

9

1/4

1/16 Wash-out

5/8 (Top and bottom sheeting is 1/2 wide, plus 1/16 sheet sides).

3/4

8

1/8 Sq. L. E.

1/16 Sq.

3/32 x 1/4 T. E.

1/32 Ribs

STABILIZER SECTION

1/16 Sq.

Nats winner had two 1/16 sq. spars at positions marked with 'x'. Later version had 1/16 ribs; choice dictated by quality of wood.

1/16 Sq.

3/32 Sq.

WING SECTION

1/8 x 3/8 T. E.

1/32 Ribs

Web for first three bays

1/16 Sq.

1/16 Wing tip flush with bottom of rib, braced by 1/16 gussets at upper spar positions.

3/16 Sq. L. E.

# NATIONAL FREE FLIGHT SOCIETY NEWS



## MEMBERSHIP RENEWALS

● Recently I have received a number of letters from irate Society Members who renewed their membership and have not received any Digests. Others renewed and then received a "Last Issue" card in their next issue. For the first problem mentioned there's no answer. I am trying to straighten out each one as it comes to my attention. The second problem is my fault. I forgot to update the renewal date cards for a number of members right after Christmas. I later sent that batch of cards to Doug requesting that he put "Last Issue" cards in their next issue. It was not until the middle of March that I realized my error. If any of you received a "last issue" card and had recently renewed *please drop me a post card*. I will get you back on the mailing list immediately.

Speaking of membership problems and delays, please keep these things in mind. When moving, please send us your new address as soon as possible. To process an address change takes us about two weeks at a minimum, usually three weeks. Also, when renewing, please try to send us your renewal form and dues at least one month prior to your expiration date. That date is normally printed to the right of your name on the Digest. If you don't find a date there, or the one that's there is incorrect; look at your membership card, the date is under your name.

## MEXICAN NATIONALS

I recently received a letter from the Mexican Asociacion of Aeromodelism inviting me to their international contest that will be held November 15th through 20th, 1974 in Mexico City. Controline events will be: acrobatics, slow combat, races, open combat. Radio control events: Formula I Pylon, Open Pylon, F.A.I. Pylon, acrobatics, and glider acrobatics. Free flight events: F.A.I. power, 1/2A gas, Wakefield Winter Cup, Nordic Glider A/1 and A/2. All events will be based on AMA rules.

Anyone interested in entering should contact me immediately, as there are problems in housing, and reservations must be made early. If you wish to contact them directly you may at the following address:

Asociacion De Clubs De Aeromodelismo  
De La Republica Mexicana, A.C.  
Registrada En La Secretaria De

Comunicaciones Y Transportes  
Av. Cuauhtemoc No. 60 1 er Piso  
Mexico 7, D.F.

## CLUB SECRETARIES

Don't forget that NFFS memberships or renewals make great prizes for contests. They are usually cheaper than trophies, and a lot less trouble. In many cases, I'm sure that the winners would prefer the renewal over the trophy. After the contest, send me the winners names, addresses, and AMA number. Include a club check to cover the memberships at the following rates: Open -

\$5.50, Senior - \$3.00, Junior - \$1.25. I will forward the memberships to the winners with a letter of congratulations, and then send a confirming note back to the club, assuring you that they were mailed out.

## DICK BLACK POSTAL CHANGE

A couple of months ago I mentioned the Dick Black Memorial International Postal Contest. In the listing of events was "FAI Coupe D'Hiver." This has been changed to an 80 Gram Coupe event; 70 gram airframe plus 10 grams of rubber.

## HELP!

Jack Shafer, Plans and Publications, has asked to be relieved, hopefully by mid-year. This chore is vital to the distribution of NFFS information and literature, and entails servicing plans orders (Jack offers to continue to make the prints), and inventory and mailing of all NFFS publications such as Symposiums, back issues, etc. This function has been a major contribution to NFFS operating funds. ●



"You simply don't understand rubber. You've got to pamper it. You've got to talk nice to it."

NFFS MEMBERSHIP AND RENEWAL APPLICATION			
(Make checks payable to; National Free Flight Society)			
Mail to;			<b>FEES</b>
B.J. Kelch, R.R.4, Box 475,			1 yr    2 yrs
W. Terre Haute, Ind., 47885			
RESIDENTS OF FOREIGN COUNTRIES			
<b>U.S. RESIDENTS</b>	Age 19 and up	AMA Members	\$6.00
		Non-AMA Members	\$11.00
	Age 15, 16, 17, and 18 (Senior)		\$7.00
	Age 14 and under (Junior)		\$13.00
	Family membership*		\$3.50
		\$6.00	
		\$2.50	
		\$1.50	
		\$2.00	
All members receive NFFS Digest		Name <span style="float: right;">AMA No.</span>	
Family membership fee includes all additional family members, but no additional copies of the Digest		Address	
Ages are as of July 1 of current year. Please circle applicable fees.		City, State <span style="float: right;">Zip</span>	
New Member	<input type="checkbox"/>	*Please list family members	
Renewal	<input type="checkbox"/>	Name	
Address Change	<input type="checkbox"/>		
Current expiration date:		AMA No.	
Month	Year		



Our 'Shrike' designer with another of his ships. C/L only, this 1-3/4" scale F9C-2 "Sparrow Hawk" (U.S.S. Macon) is powered by an Enya .60, had not been flown when Harry Sutherland took this photo.



This A-26 by Orin Humphries, Spokane, Wash., was 1973 Northwest Regional Champ. By coincidence, another A-26, by Ray Smith, of Lawndale, Cal., won the 1973 Southwest Regional Championship!

# Control line

PHOTOS BY JED

"FROM THE HANDLE"  
By JED KUSIK

● If it wasn't for bad luck I'd have none at all. Last week I crashed in a motocross race, got knocked out and had five stitches in my mouth. This week I am back in the hospital, this time with a short right thumb after losing a combat match with a table saw. That was one kill cut I could have done without!

Our illustrious editor (*Between you and Mooney, I'm beginning to believe I am illustrious! wcn*) has always seen fit to make a comment about how I

hand letter my column each month.

So I look forward to his comment when I turn in this copy which I am writing (? *wcn*) with my left hand. Believe me when I say that my left hand stunt pattern is smoother than my left hand lettering.

I have been writing for MODEL BUILDER three months now, and have had many comments, both good, and bad. The most common question is, why don't we have more construction articles and new designs?

The answer to that is easy. No one has offered up any material to the great god "MODEL BUILDER." We will use most any good material that our disciples send us. I would like to continue with a monthly 3-view of all types of models, both sport and competition. So send a sketch of your latest or best, and I will make the drawing. (After my thumb heals so I can use my right hand again.) I have a good profile carrier design from the same folks who developed the Dumas "Crusader," but



Dick Byron cranking up his ST .46 powered "Shark 45."



Dave Trible placed 3rd in Open Stunt at the Midwest Champs, Kansas City. OD 'Telepathy'.



Dave Tribble launches Dennis McGinty's Super Chipmunk; first in Jr/Sr Stunt at Midwest Champs with a 400+ score.



Dick Byron's ship takes off for official flight and first in Open Carrier at the May 25, 26 Midwest Champs.

you will have to wait until next month for it.

There are many clubs that send newsletters to the magazine, but unfortunately, most of them do not state on the outside cover what department they should be directed to, or give no clues about club interests. Those blank covers go into a big monthly pile, and maybe, if we have time, get sorted. So do it right and I will be able to find your

club paper when it comes. So far only nine club papers indicate control line orientation. They are:

1. ORBITING EAGLES, Omaha, Nebraska.
2. AERO MODELERS, of San Jose, California.
3. MINNEAPOLIS PISTON POPPERS
4. UTAH STATE AEROMODELERS
5. GREATER ST. LOUIS MODELING ASSOCIATION.
6. COASTAL BEND AEROMODELERS, Texas
7. SPRINGFIELD Balsa BUSTERS
8. LODI MODEL ASSOCIATION, California
9. SPINNER SKINNERS, Kansas

The rest of the clubs ought to clarify their identity.

NEW OR SPECIAL CLUB EVENTS FROM AROUND THE COUNTRY

1. Trash Can . . . MBPT
2. Destruction Derby . . . MBPT
3. Farout Flying Machines or (Crazy 1/2A) . . . Spinner Skinners
4. WW I 1/2A Fun Fly (Snoopy & Red Baron)
5. Courage Combat . . . Modesto Flying Class
6. Tag Team Combat . . . MBPT
7. Handicap/Scratch Stunt . . . Utah State Aeromodelers
8. .35 Goodyear . . . MBPT

If any of these events interest you, write and say so, and we will print the details.

STUNT SKILL LEVELS

Level I - Cannot recognize stunt model.

*Continued on page 53*



If you can see it happen, it must be Slow Combat! Sky Burners of Norwalk, California.



Dennis Duvall's 2nd Place Open "Macchi 2" stunt ship at the Midwest Champs. Glad to see more scale stuff in the non-scale events.



Kevin Cooper enjoys "Sunday Funnin'" with this Goldberg Buster in Cerritos, California.



Another unsuccessful attempt to break the ground barrier. Don Wise likes to build slow combat models. He better!



Bryton Barron and his Playboy Senior at a Florida State meet.



# PLUG SPARKS

By JOHN POND

● How were the Old Timer Events at the Free Flight Championships held at Taft over the Memorial Day holidays? Just great! But boy, was it hot!! Saturday wasn't too bad at 95 degrees, but Sunday and Monday registered better than 105!! If you like heat you could have gone out of your gourd!

To top it off, the SCIF and SCAMP clubs jointly ran a beautiful contest for the Old Timer events. Entries were higher than last year, if this is possible

to believe. The writer checked the Class C event after lunch, and found over 30 entrants at that time. Wow! It goes without saying, the Old Timer Events more than paid their own way. Rumor had it that trophies and prizes would be given out to fifth place with such good attendance. It'll be that way next year!

Free Flight never fails to amaze the writer as he peeked into Larry Boyer's camper and found a Sailplane wing in

the process of being put together on the morning of the contest! When the results came in that afternoon, imagine the surprise at seeing Larry Boyer as winner of the Class C event. This very feature, being able to win with an untried model, is probably the great attraction of old time flying. Several (or even one!) good flights will generally place you. One thing for sure, you don't have to make a half dozen identical flights to prove how consistent your model is when you are often times quite lucky to get the model back after a flight.

Every dog has his day! Is that ever true in the case of Otto Bernhardt. One of the best liked fellows on the contest field, Otto has been flying for years with only mild success. At this big meet, however, Otto really came on like a champ, winning the Antique Event, knocking 'em dead in Class A, and then getting barely nosed out in Class B by five seconds! Couldn't have happened to a nicer fellow! Otto Bernhardt for mayor!

Well, we could yak-yak about this contest all day, but let the results speak for themselves. Notice how close the times were in Class C. Whew! To indicate the caliber of competition, Dave Sweeney of Dallas, Texas, got a sixth place in .020 Replica with four maxes and one two minute flight! Not a bit



Roy Turner, Fort Smith, Arkansas, placed 2nd in 20 second Antique with his first R/C O. T. ship, this (Sorry, Duke) Spitfire powered Shereshaw designed Cumulus, from Flying Aces mag.



Pat Laughton took this photo at the 1941 Chicago Nats as Sal Taibi launched his 'C' Pacer for its winning flight. Who else is in the picture? Looks like Dick Korda at the far right.



Ron Sharpton took this photo of daughter Kim and his Strato Streak. Garami was 20 years ahead of his time!

discouraged, Dave took his Comet Clipper over to the Payload Event at the regular free flight circle, added the one ounce dummy and proceeded to give the other boys a lesson in flying. His nearest competitor was better than two minutes away. Those hot old timers are too much for the modern boys!!

.020 Replica

- |                   |       |
|-------------------|-------|
| 1. Bob Oslan      | 17:14 |
| 2. Marty Thompson | 16:24 |
| 3. Gene Wallock   | 14:36 |
| 4. Ron Whittman   | 14:18 |
| 5. Greg Rasmussen | 13:37 |

O.T. Rubber Comb.

- |                      |       |
|----------------------|-------|
| 1. Ray Berens        | 21:21 |
| 2. Matt Johnson      | 15:00 |
| 3. Len Kiracofe      | 12:22 |
| 4. Phil McCary       | 12:09 |
| 5. Vincent Constanzo | 9:51  |

30 Sec. Antique

- |                   |       |
|-------------------|-------|
| 1. Otto Bernhardt | 12:17 |
| 2. Fred Emmert    | 11:02 |
| 3. Abe Gallas     | 10:25 |

- |                |
|----------------|
| 4. Cliff Silva |
| 5. Bob Oslan   |

Class A Gas

- |                                 |
|---------------------------------|
| 1. Otto Bernhardt (Aerbo)       |
| 2. Bruce Chandler (Thermal Th.) |
| 3. Bob Longstreet (Ranger)      |
| 4. Phil McCary (So Long)        |
| 5. Larry Clark (Dia. Demon)     |

Class B Gas

- |                              |
|------------------------------|
| 1. Al Rasmussen (Zipper)     |
| 2. Otto Bernhardt (Alert)    |
| 3. Jerry Otis (Zipper)       |
| 4. Bruce Chandler (Amr. Ace) |
| 5. Dell Rheume (Alert)       |

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Class C Gas

- |                               |       |
|-------------------------------|-------|
| 1. Larry Boyer (Sailplane)    | 12:19 |
| 2. Ron Martin (Playboy)       | 12:02 |
| 3. Hugo Lung (Sailplane)      | 11:49 |
| 4. Bob Longstreet (Sailplane) | 11:29 |
| 5. Don Dodd (New Ruler)       | 11:09 |

OLD TIME R/C FREE FLIGHT CONTEST

As ballyhooed in this column and sponsored by the San Diego No-Name Club and MODEL BUILDER, with generous donations from Mini-City Hobbies, this contest was held at Taft in conjunction with the Old Timer Events featured in the National Free Flight Championships. Whatta mouthful that was! But regardless, this was the first time a limited engine run contest for O.T. R/C free flights had been held on the West Coast. This type of meet has



This patriotic looking New Ruler was flown by Ed Banke at the Georgia State meet.



become extremely popular in the east.

Event was based on a 20 second engine run with a 10 minute max. Actually, it was precision, as the contestant would lose a point a second for time in the air over 20 minutes. A spot landing circle was available for an additional 50 points, if you touched down inside the circle. Max points for one flight, 650.

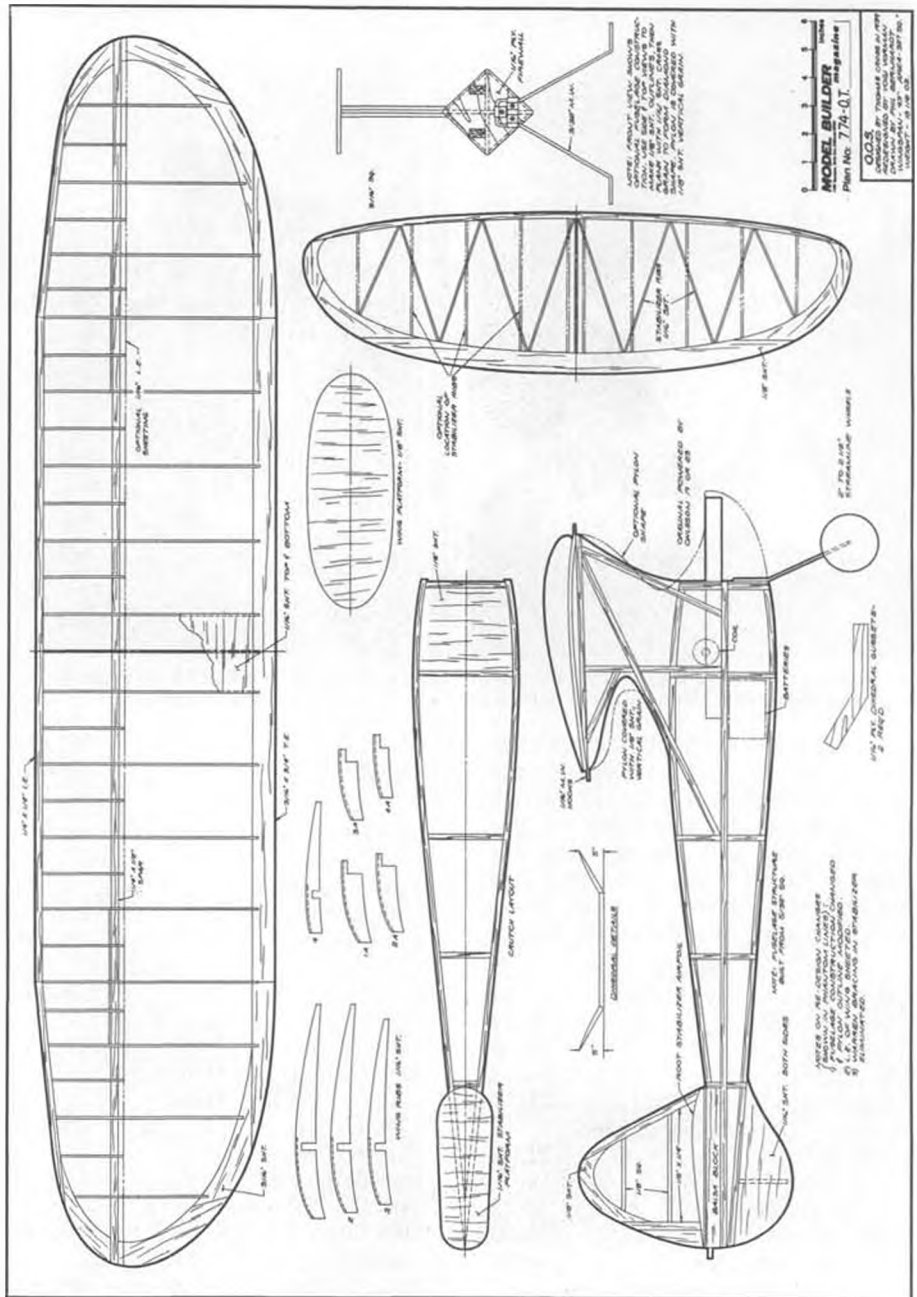
Having helped Gene Bach, Contest Director, set up his processing tables, the writer was puzzled at the lack of models around the general area. A short walk down the line of cars soon revealed the answer. Red Barrows had brought five models for this meet and set them out in the clearing by his van. With so many models in one location, contestants naturally thought this was where the action was! They weren't far wrong.

With thermals a little light for the R/C versions of old time free flights, flying didn't start in earnest until after lunch. Roy Turner from Ft. Smith, Arkansas, knocked the props out from under the boys when he registered a nine minute flight with his Spitfire powered eight foot wingspan Cumulus, a design by Ben Shereshaw. His model represented old timers in the best tradition.

Long flights by Pond and Nick Sanford immediately ensued, as lift was excellent. Nick, flying a radio model for the third time in his life (two test flights at Santa Rosa), almost won the contest, but blew it because of inexperience. The long flight exceeded ten minutes to the extent that all time over ten was deducted to give a seven and a half minute flight. Regardless, fellows pay attention! If Nick Sanford can fly with so little experience, this has to be a fun event anyone can enjoy.

"Panicville" really set in on Spiro Nickolaw again as he seems to have a propensity for getting his PB-2 so high and far away, that he has trouble determining which way it is going. This time, the model really got away and was not recovered for several hours. Spiro didn't suffer from help as no less than four glasses were on the model or what was thought to be the model. If it hadn't been for threatened loss of the model, the amount of free advice given would have been absolutely hilarious.

Some entertainment was provided by Bill Northrop and his Powerhouse when his throttle linkage stuck on a medium low motor setting. With the engine set at its most economical adjustment, the model flew better than fifteen minutes, with Bill making desperate low passes at the sagebrush attempting to stop the motor. Did you ever try to hit a low object? Needless to say after a record number of entertaining touch and go's, the engine finally ran dry.



NOTES: The meet was a delight from the spectator's viewpoint, with Lennie Curiel and Red Barrows putting up flights. Poor Jerry Otis neglected to read the closeoff registration times and was unable to enter and fly officially. Barrows brought up a video recorder, complete with playback capability. Later viewing of the films proved well worth watching.

#### RESULTS

1. John Pond (Raider)	19:21
2. Roy Turner (Cumulus)	14:15
3. Nick Sanford (Playboy)	13:30
4. Lennie Curiel (Gas Champ)	10:08
5. Red Barrows (New Ruler)	9:55

#### NORTHERN CALIFORNIA NEWS

Finally heard from the Antique Model Plane Society of Northern California

(AMPS). Dick Dwyer reports their first meet of the year was successful, staging only two events; .020 Replica and rubber combined. Don Wrench won the .020 Replica event with Howard Flohr copping top honors in the rubber competition.

Of great interest is the announcement that the 14th Annual Stockton Old Timers contest (the original!) will be held in conjunction with the Fresno Gas Model Associations Annual. This will be a two day meet running on September 28 and 29. No mention of the events to be held, but reports indicate all standard SAM events will be included.

The paper put out by the AMPS called the AMPS - METER is undergoing some big changes, according to Dick Douglas who is spark-plugging the effort. Among the things he proposes to do to make the newsletter more interesting is to establish a photo page, a buy-sell-swap column, publication of



## OLD TIMER Model of the Month

Designed by: Tom Cross

Redrawn by: Phil Bernhardt

● The Out O' Sight was patterned after the Megow Ranger, and was first built in September, 1939 by Frank Cross (killed in WW II as a bomber co-pilot). It flew out of sight at its first contest, which determined its name and also earned it first place.

The design was adopted by the Chicago Model Nuts as the club model. Hal Beebe lost the first of many to fly away. Warren H. "Yogi" Vorman also won many places with the design. The last O.O.S. was lost by Yogi at the 1948 Chicago Aeronut contest.

Authentication of the design was made in 1956 by Jim Baron and in 1956 by Warren Vorman. Dotted lines indicate changes made by Vorman, including the simplified, all sheet diamond fuselage. ●

Bob Bisset placed 4th at BAC/DC Meet with his "Out O' Sight". One of the better looking offshoots of the original '37 Zipper.



Ove Pettersson, of Vastra Frolunda, Sweden, displays a 1937 rubber design by Arvid Palmgren.



Terry O'Meara turned out this light weight Cavalier 60. Note lack of planking on fuselage.

badly needed field maps, and more reports on the flying! This is something that is badly needed in this area. Lotsa luck, Dick!

### OLD TIMER CHAMPS, WESTERN STYLE

As previously reported back in February, the Boeing Hawks have organized what they call the "Washington-Oregon Old Timer F/F Champs." Held in conjunction with the Norwesters MAC of Portland, Oregon, this one day contest offers the following events:

Ignition Pylon, Ignition Cabin, Glow Cabin/Pylon Combined, 30 Second Antique, .020 Replica, Stick Rubber, and Cabin Rubber.

In the event you can't get to the "biggie" at Lakehurst NAS, this meet to be held on July 7th at Harts Lake Prairie, Fort Lewis, Wash., offers a good alternate way to go. Donald J. Dodd of 10848 32nd St., S.W. Seattle, Wash., 98146, will be the Contest Director and all inquiries should be referred to him.

Might also mention that trophies are to third place in each event, plus oodles of merchandise prizes for following places. Makes it worth your while just to enter!

### BOO-BOO DEPT.

Received the latest contest notice from the Central Jersey R/C Club announcing a six-event "SAM Warmup" meet. Of course, by the time this hits print, the contest will have been history but the point that James W. Clark makes is that the Nov. 4 O.T. meet at Lakehurst was staged by the C.J. R/C Club. Jim further states no hard feelings as any publicity for these exciting O.T. R/C events helps everyone.

### SUGGESTION CORNER

The writer has received several letters from readers (that makes two!) asking for more pictures of rubber powered models. In rebuttal, the writer sez, send in those photos! We hate to publish too many photos of local activity as the

column starts to get a provincial look. However, we will dig up some pics to show rubber activity is quite healthy.

### ENGINE CONVERSIONS

We have more or less taken it for granted everyone knew about Bruce Chandler and his engine conversion service, when we gave plugs to other companies offering the same. It now appears this columnist has been remiss in his reporting as Bruce Chandler has greatly expanded his line of spark ignition engines.

Chandler's latest addition is his Black Knight .10, which supplants the Cox .09 conversion motor, as the Cox .09 is in extremely short supply. These new .10 engines look and run real great. Also worth mentioning is Bruce's new accessory line which includes such items as coil, condenser, V-2 Spark plugs, clockwork shutoff timers, and many others.

Your best idea is to write Chandler Engineering Co., 7858 Farralone Ave.,

*Continued on page 50*



Don Amedo's Porsche 917-10. Only major appearance deviation from Jody Scheckter's full size car is the name on the wing, and the wing placement.

# R/C AUTO NEWS

By CHUCK HALLUM

● The linkage arrangement from the servos to the steering and throttle/brake are very important. If the mechanisms are not properly set up, high speed or low speed steering can be affected and maximum power and braking will not be delivered. The linkage arrangement of a car set up is often neglected by both the beginner *and* the expert. Radio equipment installation will be covered in a future article.

Figure 1 is a functional schematic of the steering and throttle/brake linkage channels. The only difference in the two channels is that the steering has one input and one output, while the throttle/brake has one input and two outputs. Let's have a look at the steering linkage arrangement first.

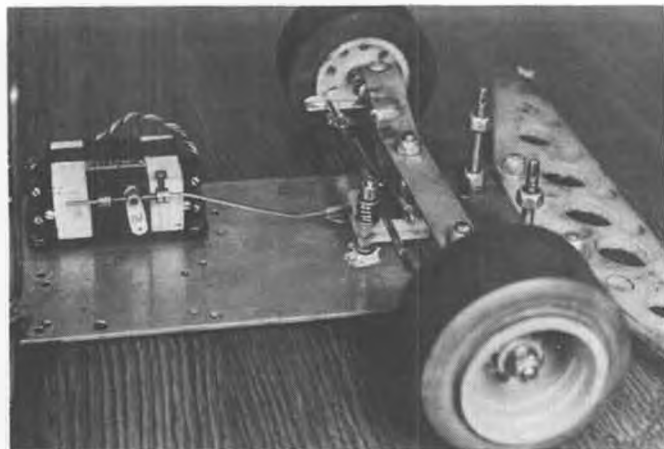
As depicted, the servo output is the linkage input and the linkage output is the front wheel position. Commonly the linkage can be called the override. The linkage arrangement provides pro-

tection for the servo amplifier, motor, and gear train. Even if the servo were very strong electrically and mechanically, a linkage providing preload, spring rate, slop (dead band) and motion limits might be beneficial. Initially, the override had to be very "soft" because the servos had gear train, motor, and amplifier failures. However, the newer radio servos are quite strong and the override can now be "firmer" if we desire it.

The things that determine the required override/linkage characteristics are kingpin location, car speed range-track configuration, tire bite, and driver preference. The linkage arrangements could have been included in the chassis/car adjustments concluded a couple of months ago. When the kingpin axis is close to the center of the tire contact patch, a softer override can be used, since the required steering forces are lower. Just look at the cars on the track to see the trend. The older Delta and

Thorp cars have firm override because the kingpin axis does not intersect the tire contact patch at all. The Taurus HRE and newer Associated, Delta, and Thorp front ends have the kingpins well inside the wheels and a soft override can be used. With strong servos, car handling can be nearly identical for both kingpin locations by providing the proper linkage. The only penalty for the large kingpin offset is a higher power drain during cornering (and a stronger servo is required).

The speed range attained by the car on the track is important, because the aerodynamic down force at high speed changes the required steering force (with any kingpin offset or caster, steering force will vary with car speed). Weight transfer during cornering also increases with speed, affecting required steering force. So, for any given override preload, there is some speed-turning radius (breakaway point) where the override will release and allow relative motion between the wheels and servo. As the override preload decreases the breakaway point decreases. In general, if the override releases, it appears to give high speed understeer. The maximum over-



Thorp-DuBro steering override combines Thorp servo saver action and DuBro soft center (slop) for tight servo installation. Fig. 2



Associated-HRE steering override. Output spring wires can be bent to give soft center, slop, some spring rate or preload change. Fig. 3

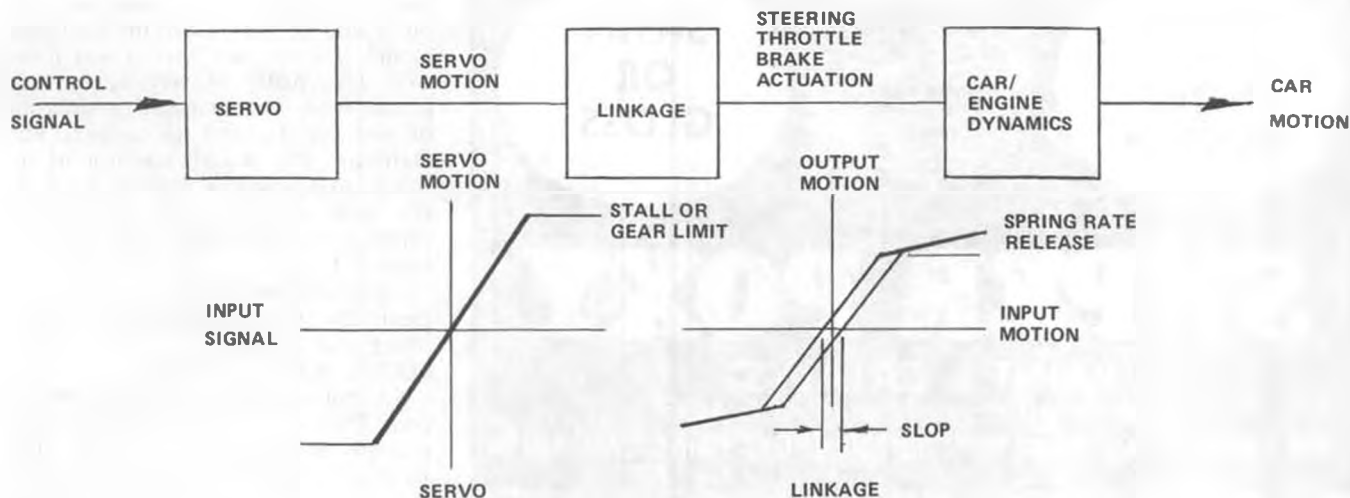
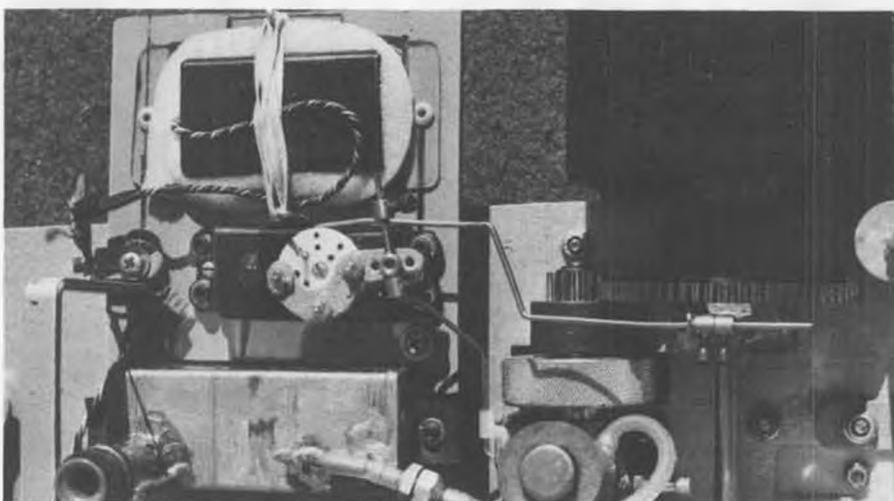


FIGURE 1. SERVO CONTROL BLOCK DIAGRAM

ride preload is dependent on the servo strength. If you have a personal preference for high speed understeer, then the preload and/or spring rate can be decreased.

Front tire bite mostly enters the picture at high speed, if there is a tendency toward aerodynamic understeer. If the wheels are turned and the front end is sliding or "pushing," then there is a tire bite problem, causing understeer (not an override caused understeer). Stickier front tires, or a reduction of "aerodynamic weight transfer" is required. Which to change depends on the low speed characteristics . . . see previous articles on tires and aerodynamics. In general, if the low speed turning is O.K. then work with the aerodynamic forces.

*Continued on page 64*



Dual Output Bellcrank for throttle/brake actuation. No intermediate bellcranks are used in this servo linkage installation. Servo is mounted vertically. Fig. 6

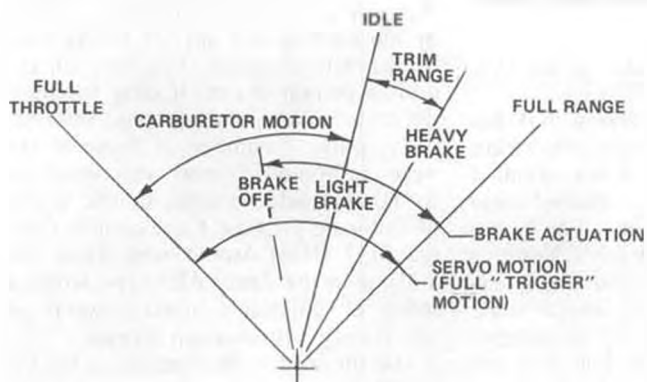


FIGURE 4. THROTTLE/BRAKE SERVO ROTATION RANGES

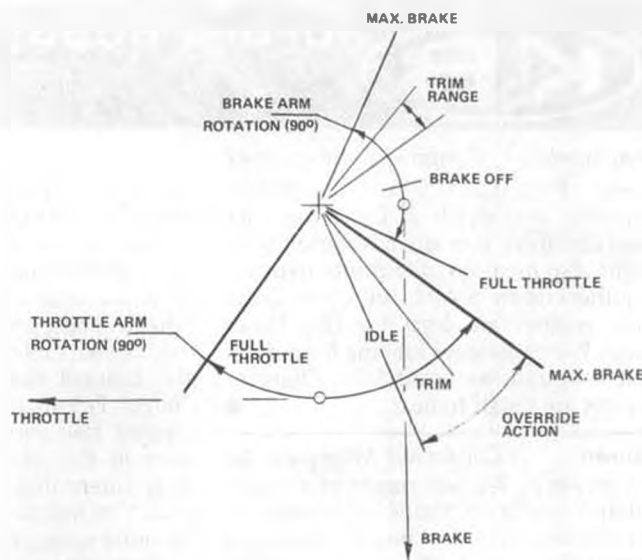


FIGURE 5. SINGLE BELLCRANK THROTTLE/BRAKE ACTUATION RANGES

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NOW  
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OR  
GLOSS

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### Plug Sparks . . . Continued from page 47

Canoga Park, Calif. 91304 completely outlining your needs. If Bruce can't fix you up, then you do have problems! Might also mention in response to many inquiries; under S.A.M. rules, converted glow engines are legal for Old Timer usage. For those guys looking for motors that start and run beautifully, Chandler engines are tough to beat. ●

### Hannan . . . . Continued from page 34

are minimal. We will report in a future column about methods of protecting the models during shipment, insurance suggestions, etc. Suffice it to say, we have received interest in the idea from England, Germany, France, and Austra-

lia, as well as several parts of the U.S. GHOSTS, ANYONE?

One of the phenomenons that has resulted from the increased participation in indoor scale contests, is the so-called "ghost" ships, which have attained some truly remarkable durations. For example, Colonel Bob Randolph's Nesmith Cougar Peanut has achieved flights exceeding four minutes on several occasions in the Santa Ana Blimp hangar. It is interesting to note that this approach to indoor flying has been around for quite some time.

In the October, 1939 issue of Model Airplane News, is a construction article by William Gough, Jr., describing a Gee

Bee Sportster "D," indoor model which was actually covered with microfilm! Even more remarkable is the fact that it was covered *after* being assembled! Another surprising aspect of this particular model was the fact that it was flown with a propeller of very nearly scale proportions, yet managed a duration of two minutes and six seconds. Furthermore, this model was not of the abbreviated structure variety, but actually quite complex, with wing struts, wheel pants, and rigging accurately represented.

Obviously, we all have a lot to learn about the true possibilities of indoor flying scale models.

### BOOKS, BOOKS, BOOKS

(A hobby within a hobby). How's your library? If you don't have one, you are missing some truly rewarding aspects of model building. It has been said that every question ever asked has been answered at least once in somebody's book. This is particularly true on the subject of model aircraft, since virtually all the problems encountered are of the same type that have puzzled builders from the very beginning of aviation. What a pity that so many man-hours have been expended in re-solving these enigmas over and over again! Admittedly, it's all part of the challenge, but it also accounts for much of the frustration (and loss of interest) on the part of novice aeromodelers.

The oldest book devoted to miniature aircraft in our hangar archives is "The Theory and Practice of Model Aeroplaning," by V.E. Johnson, which was published in 1910. This little gem covers not only the history of models, theory of operation, and construction suggestions, but thoroughly examines the subjects of motive power and propellers . . . and we do mean thoroughly! Were you aware that at this point in time, models had already been powered by gasoline engines, steam, compressed air, and CO<sub>2</sub>? To hear some present-day modelers talk, one might assume the "Old Timer" dated back to only 1930 or so!

Not all authors have been this knowledgeable, of course, and quite a few of the early model aircraft books have been pretty marginal. Yet, they all exhibit a certain charm, if only for their illustrations and photographs. Interestingly, quite a number of these books were authored by men who went on to notable achievements in the world of full-scale aviation. For example, General H.H. (Hap) Arnold, who while still a Major in the Army Air Corps, wrote a series of children's books, several of which dealt with aviation themes.

To the avid scale modeler, a library is almost essential. And never were a greater variety of offerings available! A literal flood of aircraft books has spewed forth from the printing presses all over the world, especially within the last ten

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years or so. Obviously, discretion is in order when shopping for these items, not only for financial reasons, but because many have appeared which are of questionable value. Some would be better read at your local public library rather than purchased, but others offer terrific value, even at today's prices.

If you are just starting to accumulate your own reference collection, we offer the following suggestions: First, check out the used book stores in your area. Often, fine bargains can be found, and you can sometimes arrange for the dealer to notify you in the event he receives other books of interest. Usually, their stocks change frequently, and

it is certainly worth a visit every so often. Next, consider the bargain tables of new book stores. Some of the nicest books in our collection were "publishers' remainders," marked down to as little as 25% of their original prices.

Other sources of aviation book bargains are garage sales, swap meets, flea markets, etc. Part of the fun is in the hunting, and who knows, you might just stumble across an old ignition engine in the process! Watch the magazine adverts for books, especially the classified section. Sometimes, one will see entire collections for sale, and then too, some of the used book dealers who specialize in aviation books will offer

catalogs of their offerings. Typically, the prices asked will be higher than run-of-the-mill book shops, but they usually provide accurate descriptions of the items, and in some instances, you may feel the prices are justified.

Some of the best values are available in reprints, which are usually cheaper than originals of scarce volumes. Then too, certain offerings were published before the inflationary trends appeared, that still are obtainable at low cost. Books represent a good hedge against inflation, and are almost certain to increase in value, in the event one may need to dispose of them in the future. ONE OF A KIND.

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We received a letter here at the hangar asking if plans were available for Marylin Cover, popular model building wife of Hal Cover. Although several suitable responses to the request sprang to mind, all seemed subject to misinterpretation (or outright censorship! wcn).

C/L . . . . . Continued from page 43

- II - Owns ringmaster kit . . . cannot understand instructions.
- III - Prepares plane, fuel, lines.
- IV - Starts own engine, flies with help.
- V - Flies unassisted - nearly level.
- VI - Does good wing overs . . . 10

- ft. pullout.
- VII - Does inside loops.
- VIII - Does lazy eights.
- IX - Flies inverted . . . nearly level.
- X - Talks about his contest potential.

Idea from: ORBITING EAGLES, Omaha, Nebraska.

### BASIC RULES OF MODELING

Glide paths can be stretched, but only when overshooting your pit crew. A hole pokey in the wing will have no effect until airborne.

Things epoxied into position the night before are not necessarily in the right position.

CG . . . Center of Grief.

Figure 9 . . . The last maneuver in my new stunt rule proposals.

Combat is two guys trying to get their engine started before the other. (Much the same as Goodyear.)  
MUSINGS

It has to happen, there is no other alternative . . . the next shortage will be glow plugs! After all, we've run out of everything else that we blatantly misuse, so plugs just gotta be next. And you know why? Because people waste the little boogers; use 'em once and throw 'em away.

"Bazook," he says. "I'm really bummed. I must foul 17 plugs a day. I can't figure out what's wrong. I've tried dif-



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ferent head bolt tightening sequences, changed the glow clip, adjusted the prop position, and even put on a set of low bounce tires. Fudge."

The thought never occurred to him that burning "belch-fire 90" pure nitro, and slim Jim's Skinny Pick Speed Stick props might have something to do with it.

If you want to avoid standing in long lines at the hobby shop in a flurry of panic plug buying, hassling with "Oregon Plans" of only being able to buy K&B's on even days, Fireballs on odd days, or worst of all, plug rationing, you would be well advised to start an effective plan of glow plug conservation . . . or as we like to call it, "Don't blow the glow."

First, don't throw them away unless the element is complete missing. You'd be surprised how many plugs you waste just by throwing them away. Many plugs that don't seem to work too well in a "Snot Fire Forty" run swell in your Sunday Foo Foo plane . . . mostly because they were designed for low nitro use in the first place.

The best way, of course, to conserve your plugs is to never take them out of those neat cardboard and plastic packages. Tucked snugly away in your toolbox, they'll last, literally forever. (You mean, "No use is good use?" wcn)

*Please be quiet and keep your cool.*

It is pleasing to note that more and more flyers are using mufflers because they want to and not because of some stiff rule in the books. Also many competition stunt pilots have discovered that they can concentrate more effectively when their model is flying quietly. The illusion of smooth flight is also created, which has to help in competition.

One feature which stands out on many of the new, quiet models, is most unsightly and totally unnecessary . . . the uncowled engine . . . don't jump up and tell me the engine runs hotter with a muffler, I know that. I also know that an uncowled engine runs hotter than one that is properly cowled. The trick word here is "properly." A "Coward cowl" does more harm than good for a stunt engine.

A Carlsbad cowl is a giant cavern, usually scale appearing on the outside, but with nothing but empty space on the inside. This type of cowl can actually make your engine run hot and erratically. Most of the new stunt kits have this type of pretty plastic shell cowl that really does nothing more than hide the engine. Before you can build an efficient hardworking cowl, you have to understand what happens to the air in the cowl.

First of all; air does not want to flow close to an object, or into small pieces

(such as fins), if it has someplace else to go.

Second; hot air expands very rapidly and will actually force cool air out of the cowl if the ducting is not correct.

Third; air is sticky and tends to adhere to the surfaces that it flows over.

Now, here is what you need to do to have a proper, hardworking cowl. Build the cowl in layers, using 1/4 or 3/8 inch sheet balsa. The reason for this is that the inside shape must closely follow the exact shape of the engine, with only a 3/32 inch clearance.

Blows your mind, doesn't it?! No big gaping spaces in there. The air must be forced to flow in contact with the metal for best cooling efficiency.

You also need the proper size opening, to allow in the correct amount of air. Measure the height of the cooling fins on the cylinder. Do not include the head. This will be the height of the opening. The width will be 3/4 of the height. Rear air exits should be twice the frontal opening to avoid reverse pressure build-up due to head expansion.

Special attention must be paid to the air gap around the head. If the top is curved, then the wood must be carved so as to maintain an even space over the top. Don't put a flat surface opposite a curved one, that is the hot setup, not the correct setup.

When building up the layers around the engine, each one should be resined and carefully sanded to a very smooth finish. This is extremely important for proper airflow through the cowl.

I know it takes more time to build a good cowl, but the increased efficiency is worth it.

I am going to stop writing now, without saying all that I would like to this month . . . because writing wrong handed is a real bummer.

God bless you all and may the wind be ever at your back. ●

**Bathtub . . . . . Continued from page 27**

sheet sanded to 1/64 and mounted on hub section at 40 degrees to the propeller shaft. Add a few small teflon washers, install on the thrust button, and bend a rear hook for the rubber.

The open fuselage work is made from fairly hard 1/16 sq. stringers, sanded round. Make the top crutch over the plans . . . starting from the front of the wing. Add the side uprights and lower longeron section to make the triangular part of the fuselage. Note the incidence in the stabilizer. Glue the lower longeron to the back of the bathtub and add the two uprights from the top crutch at the front of wing position to the bathtub. Then add the other two uprights and the stringers from the front of the crutch to the engine. Add rear rubber hook. This construction is a little different than the usual, but it has adequate strength and the fuselage doesn't distort under a fully wound motor.

Stabilizer and rudder are made of two laminates of 1/32 sq., with 1/32 sq. cross members. The method I prefer here is to make templates of cardboard or 1/16 sheet for the rudder and the two halves of the stabilizer, about one inch longer than necessary. Rub edge with candle wax, soak the oversized stringers for about an hour, bend the 1st laminate around the form, taping it in place at the base only. Now a light coat of Elmers glue thinned 50% with water. Add second laminate and tape over the first tape. Let dry, cut off above the tape, and your rudder and stabilizer outlines are complete. Add 1/32 sq. cross members and sand finished tail to round shape.

Wing is light weight 1/16 sq. leading edge and trailing edge, with 1/8 x 1/32 center stringer, 1/32 sliced ribs and 1/32 x 1/16 tip pieces. Cut away center section of main spar, crack leading edge and trailing edge and glue in 1/2 inch dihedral in each tip. Add 1/8 x 1/32 center piece to main spar . . . 1/4 inch longer on each side than the center section to lock in the dihedral. Sand leading and trailing edge to airfoil shape.

Cover wing and tail with condenser paper and glue in place on the fuselage. Check center of gravity and add clay to nose or tail, if necessary. No weight was required in the original model.

You may notice in the photos that the wing supports have not been installed on the indoor model. I use a bit of wing warp to keep the inside wing up for circle, with opposite rudder. Balance of adjustments are with side and/or down thrust. When fully adjusted, add the wing supports.

A word about the outdoor version. The tub is 1/32 sheet sanded to 1/64. The nose block is balsa. Engine is 1/16 tube. Fuselage is 1/20 sq. spruce sanded round. The tail assembly is the same as the indoor version, but beefed up a bit. Wings use full depth ribs and top spar of 1/16 sq. Cover with colored tissue and add paint trim. This one needed some weight in the tail so I have now gone to a balsa prop, similar to the indoor version, instead of the plastic prop.

Both fly very well, and the indoor version gets well over a minute in our 20 foot high ceiling gym. Build one, and watch the other modelers drool over it.

**Mooney . . . . Continued from page 35** wire bracing just like the real thing. Note that the top longerons are spread wider apart than the bottom longerons. Thus the wing only contacts the fuselage structure along the upper longeron. Without the wire bracing (monofilament fishing leader) the wing attachment would be somewhat fragile. Although this method adds some complexity to the usual approach of just cementing the root rib to a flat fuselage side, it offers the advantage that dihedral is adjustable by rerigging the bracing, a



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"Big Windy" designed by Tom Kelley of the C.A.R.D.S. club of Lansing, Michigan. 1st in design at Toledo, 1st in finish at Elmira, 1st at DCRC meet. Hobbypoxy finish, sprayed and rubbed. Photograph by Bud Manning, Detroit.

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simple job with monofilament, which can be shrunk with the application of a little heat.

The model has been drawn for, and the drawing calls for balsa in the standard sizes of 1/32nd sheet, 1/16th sheet, 1/16th square sticks, 1/16th by 1/18th sticks, etc. It can be made this way and will surely work well. If most of your flying of peanuts is done outdoors, I'd recommend following the plan. The model in the pictures, however, was built with 1/20th square instead of 1/16th, and 1/20th sheet instead of 1/16th sheet. This results in a considerable reduction in weight. This special "Peanut Size" wood is available by mail from PREMIER Co., P.O. Box 8264,

Long Beach, Calif. 90808. For more information send a stamped, self-addressed envelope to them. I have been much impressed with the quality of their wood, and of course delighted that they have started cutting Peanut sizes.

Structure on this model is fairly standard, but there are subtle differences that warrant special discussion. The airfoil section of the wing is not flat bottomed. I chose to use a scale-like (I don't know what the exact airfoil ordinates are) airfoil section that has a very small pitching moment. This requires that when the wing is built over the plans, the trailing edge must be supported above the plan about a sixteenth of an inch.

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The fuselage basic structure consists of two sides built over the plan, removed from the plan, cemented together at the tail post, and then separated from each other by a series of cross pieces at the location of each upright, to make a common box structure. It's important to note, however, that this fuselage box is not rectangular in cross-section, but trapezoidal. That is, the upper longerons are further apart than the lower ones. Care is required in making this basic assembly. Because of the difference in width, fuselage sides that are assembled over the plan shown will curve upwards at the tail, resulting in a little nose up adjustment of the tail.

This happened in the case of the model in the photos, and was left that way without any noticeable change in the shape. If you wanted to compensate for this, you could, during assembly of the sides over the plans, shift the longerons at the tailpost downwards 1/16 of an inch.

The nose contours, except at the very front, are angular and generally straight-lined. Therefore, on this model, the cowl has been built up of sheet balsa; 1/16 sheet was used between the first two fuselage stations, and 1/32 sheet was used from there aft. The cross-section of the nose block requires that you fill the inside corners of the forward part

of the cowling with 1/4 by 1/4 triangular balsa so that the very front of the cowling just aft of the nose block can be carved to the rounded shape of the noseblock.

The landing gear wire comes out of the fuselage about 3/16 up from the bottom. To install it, cut a narrow notch in the lower structure and then fill the notch after cementing the wire in place.

The vertical tail is an integral part of the fuselage structure as finally assembled. The top center stringer cements to the vertical tail leading edge and a small sheet balsa fillet makes the curved fairing between the stringer and the fin. Fuselage and fin covering is continuous. This means that the horizontal tail must be covered and installed before the vertical tail is installed and the top of the fuselage can be covered.

My propeller spinner was carved from block balsa and hollowed out. It was then epoxied to a Peck Polymer 4-3/4 inch diameter plastic propeller, after installing the prop hook. Usually I put a winding loop on the front of the prop, but I felt that this would louse up the looks of the spinner, so for mechanical winding, the noseblock must be removed and the rubber disconnected from the prop hook. This is a little less convenient, but I've seen a lot of photos of modelers holding props in their mouths while winding, so I'll do it too, while winding this one!

Wittman's color scheme is green on the fuselage and vertical tail and yellow wings, horizontal tail and trim. The correct numbers show in the photos. ●

**R/C Soaring . . . Continued from page 24**  
 category, and was, thus, prohibited from use for commercial purposes . . . such as training, or as a rental. In many countries, the Blanik L 13 is considered to be the standard vehicle for glider flight training, and it enjoys wide acceptance as a club-owned machine in Europe and South America. Low maintenance and rugged construction combined with docile handling characteristics are certain to make the Blanik's outstanding performance appeal to a large number of commercial operators and soaring organizations in the United States. The very competitive, advertised price of \$10,800, U.S. East Coast P.O.E., duty paid, is even further attraction.

The fuselage of the L 13 is classified as a semi-monocoque structure. It is of oval cross-section with the upper portion, forward of the wing, glazed with a tilt-off canopy covering the tandem seats. The enclosure is jettisonable for emergency egress. The Blanik's interior is upholstered and boasts heat-insulated walls. Appointments are quite luxurious compared to the stark paneling and exposed structure of many sailplanes.

The landing wheel is partially retractable . . . by mechanical leverage, pilot

powered . . . but about one-fourth of its diameter remains in the slipstream. Under certain landing situations, the recommended touchdown procedure is with the wheel in the "up" position. A conventional, steel skid forward of the wheel protects the fuselage belly. In the retracted position, the oleo-pneumatic shock absorber is not effective, but most sailplanes have non-shock mounted wheels, so landing the L 13 in this configuration should cause no unusual discomfort. Special equipment offered in the manufacturer's descriptive brochure includes skis for operation on snow.

The cantilever, shoulder-wing spans 53'-2", and has a 5 degree forward sweep measured at quarter chord. The leading edge sweep angle measures 3 degrees. Wing root chord is 5'5". Tip chord is 2'-3½". The wing airfoil section is NACA 632A615 at root and 612 at tip. Aspect ratio is 13.7. Wing area is 206 square feet. Each panel of the Blanik carries 3 degrees dihedral. Incidence at root is 4 degrees, and 1 degree at tip . . . giving 3 degrees washout. As with the other major components, the wing is all metal with flush-riveted skins. Flaps and ailerons are fabric covered. Wing tip "salmons" provide protection from ground abrasion in lieu of more common tip wheels or skids. The Blanik tip units have the appearance of small, streamlined tip tanks, and some have been "decorated" with phoney filler caps and octane rating placards . . . to the confusion of Sunday spectators.

The swept-forward wings of the L 13 are fitted with large, Fowler flaps for added lift at low speed. As opposed to the more conventional drag flaps seen on modern lightplanes, the Blanik's flaps move aft and downward to add both area and camber to the wing. According to the manufacturer's specifications, flap area is 42.52 square feet, which provides a 20 percent increase in wing area. Minimum flying speed drops from 41 to 35.5 mph with flaps fully extended. Their primary use is for slow flight while circling in thermals, but touchdown speed also can be reduced significantly if desired.

In addition to the Fowler flaps, the Blanik also features large, balanced and very effective dive-brake type spoilers. Though not listed as terminal-velocity brakes, these devices reduce the buildup of overspeed conditions no matter what the vehicle attitude . . . like straight down. Very interesting short field approaches can be demonstrated by a pilot who is knowledgeable in spoiler/flap technique. Under such circumstances, when the view over the Blanik's nose is parallel with the end-of-runway telephone poles . . . which take on the appearance of circular stepping blocks . . . the less adventuresome passenger may feel that the L 13's major short-

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coming is its lack of powder room facilities. But everything comes out all right . . . so to speak.

The tail surfaces are cantilever, all metal structures. Elevator and rudder are fabric covered. The symmetrical section, horizontal tail has 5 degrees of dihedral in each panel. These units are hinged to fold upwards, adjacent to the fin and rudder, for off-field transportation and storage.

Performance charts for the Blanik L 13 show an L/D maximum of 28 at 58 mph. Minimum sink is 2.7 fps at 40 mph. A sink rate of 6 fps occurs at 90 mph. By way of comparison, the popular Schweizer 2-33, two-place trainer has an L/D maximum of 23 at 45

mph. The sporty singleplace Schweizer 1-26 claims a minimum sink rate identical to that of the Blanik. It takes a high performance machine such as the HP-14T, Schweizer 1-34, or Glasflugel Standard Libelle to match the L 13's speed at the 6 fps sink rate. Rather impressive credentials for a sailplane that completed its prototype test flights in March 1956 . . . almost two decades ago.

The Blanik should be a great subject for the scale R/C fan. Whereas many sailplanes have inadequate wing area for modeling purposes, the L 13 offers almost 6 square feet of area at 1/6 scale. This area, within a span of only 106 inches, results in a most

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workable configuration. The builder who prefers the larger, 1/5 scale will gain 2 square feet of area but only about 2 feet in span. Either size could make a very competitive model, though the larger scale would be more efficient. A few numbers of interest are given in the accompanying table.

Model construction techniques are dictated by the prototype Blanik. Certainly the fuselage should be fully sheeted and/or planked. The free-flighters' "crutch" type of structure might lend itself to the task, or 1/8 sheet sides . . . conforming to the gentle vertical contour of the oval cross-section . . . could be used with either 1/8 strip planking or 1/16 sheet over the more severe top and bottom curves.

The lower, forward fuselage contours can best be duplicated by carved blocks. The same for the nose tip, of course. Fiberglass and epoxy or resin should be applied over the structure forward of the wing.

The Blanik fuselage might lend itself to reproduction as a very thin shell of 1/64 plywood. Foam block construction using the Hobbypoxy Easy-Does-It method is another possibility. Or foam and very thin sheet aluminum skins. There are ways to go other than with the crowd. And some could be real improvements over popular techniques . . . once the early problems were

worked out.

Flying surfaces would best be represented by fully sheeted structures, but weight buildup might be prohibitive. Some sort of hollow, sheet structure should be acceptable for tail surfaces. A compromise wing construction might utilize thin sheeting on the top only.

The L 13 offers great potential for working detail, scale operation points, with flaps, spoilers and retractable gear. That gear, remember, need not be extended prior to landing to duplicate full scale operation. Accordingly, a simple spring-loaded mechanism could retract the wheel once the craft's weight is transferred to the wing. Subsequent extension could be a manual operation accomplished back in the pit area. Very little weight penalty in a system as simple as this. And no radio controls required. A timer device could actuate retraction, or it could be linked to towline release.

The polished, sheet metal skins of the full-scale Blanik can be simulated by one of the modern, plastic film coverings with very little effort by the builder.

Tandem cockpits and the long, gracefully curved canopy provide other areas for real detailing for any builder so inclined. Suggestions for forming custom canopies were discussed in the March 1974 column, as were other general

ideas about scale soaring machines.

Depending on the designer/builder's preferences, a scale Blanik L 13 model could be anything from a lightweight floater to a highly detailed but very efficient competition vehicle. Either way . . . or whatever way in between . . . the Czechoslovakian Blanik is one of the world's many interesting sailplane configurations that has yet to be introduced to the R/C scene. Who'll do the honors? ●

**Free-Flight . . . Continued from page 39**

\$28.50, including the engine, postage and the works. Delivery time is 3 weeks. If you want to forward your own engine, Scott will provide an estimate after he has had the chance to check it over.

Interested? Drop him a line at Aero Hobbies, 18595 Marine View Drive, S.W. Seattle, Washington 98166.

**MYSTERY MODEL OF THE MONTH**

It's got a wing. It flies with a Wasp .049. It's got a fuselage . . . no wait! Where is the fuselage? Missing from the sketch? No, this ship is a flying wing.

What's its name? Who designed it? In what magazine did it appear? Oh, these questions will get you down every time. Send in the right answers and you will win a free subscription to everyone's favorite model magazine. Only hitch is you gotta be there with those answers before everyone else is. Good luck.

**DARNED GOOD AIRFOILS . . . THE BENEDEK 8353 b7**

This foil was designed by Georges Benedek specifically for FAI Power events. With the raised leading edge entry and thin percentage, the climb speed of this foil is spelled FAAAASST. There is slight undercamber to provide an inducement to gliding. This section was most recently used successfully on an FAI power model by Hans Seelig, when he won the 1967 International event. A good one.

**CALLING ALL TIMERS!**

Mike Keville is soliciting timers to help C.D. Sal Taibi with the big FAI Finals scheduled for Taft, California on Labor Day weekend. With 96 entries per day to time and process, Sal is going to be busier than a Starduster factory if we don't provide him with some help. So, if you are wondering what to do Labor Day, and a trip to Taft is in your thoughts, pack along your stop watch and give Sal a hand. Contact Mike in advance and tell him you're coming. You can reach him at 6618 Dashwood St., Lakewood, Calif. 90713.

**SOCIALIZING AT THE CONTESTS**

Most heard complaint from the home front is that contests are all business and no fun for those not participating. One of the things that make contests fun is the socializing which can go with it. The Willamette Modelers Club, of

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which I am a member, has instituted a couple of social functions which have become semi-traditional. In conjunction with our big August Annual meet, we have a family bar-b-que on Saturday evening. All the hamburgers you can eat and all the trimmings that kids and adults enjoy. The Annual Old Timer Championships are preceded by a social and a collectogether with slides and movies of the O.T. activities which have taken place during the year. (Sorry about the infringement on your column, John, but I'm interested in O.T., too . . . in fact I'm still looking for some of those good running ignition engines which everyone in California seems to come up with . . . why don't you send some up North?) . . . (By way of the home office! wcn)

Anyhow, if there can be fun for the family mixed in with fun for the contestant, it makes the whole scene a bit more pleasant for all concerned. It also gives you, the contestant, a chance to see your fellow competitors without those field and stream clothes all over his body, but really dressed up in nice Levi's and a clean shirt . . . amazing! (Socializing for all members of the family has been one of the key attributes to R/C activities. Sometimes you don't even recognize a guy you've been flying with all day long! wcn)

## JETEX LIVES

Jetex fuel and wick may be getting scarce, but plans for its remanufacture in the U.S.A. are under way. So, it will pay for you to use what you have wisely until such time as it becomes readily available again. To do so, treat it nicely, as follows:

1. Unpackage all pellets, sand the glaze off of each end, and place on a sheet of aluminum foil in a 300 degree oven for 1/2 hour.

2. Open the wick can and place in

the oven as it is cooling off from heating the pellets. Leave for 1/2 hour.

3. Store the wick and pellets in a sealed jar in a dry place. Put some moisture absorbing tablets in the jar.

The worst offender for Jetex fuel is moisture. The drier the fuel and the wick, the better the fuel . . . not only is it easier to light, but it also performs better. Try it and see. End your frustrations with Jetex.

## FREE FLIGHT HUMOR SECTION

Last weekend at a Nor'Westers contest, I was impressed by the good taste of one of the competitors there, who complimented me on the column and then said that his favorite part was the humor section. It is not my place to question his taste, but it did seem important that lest anyone not recognize that the following is intended to be humorous, I have labelled this section of the column this month to end any doubts.

"The Modeler's Multiple Choice Examination"

This test is designed to check your ability to successfully enter and compete in a free flight contest. For this test, you will need a pencil. Now, the directions: Following are a series of statements which can have several answers. You are to select the best possible answer and place the letter representing that answer in the blank provided. All questions must be answered. Ready? Begin . . .

1. When packing my car to leave for the contest, I always check to see that:
  - a. I have not forgotten any models, parts of models, or flight equipment.
  - b. My 8 ft. wings fit inside of my V.W.
  - c. My gas tank is full.
  - d. My car's gas tank is full.

e. All of the above.

f. None of the above.

2. Before packing my car to leave for a contest, I have\*already prepared my flight equipment and models by:
  - a. Testing all of my engines to see that they run . . . no matter what time of night it is.
  - b. Dewarping all the wings and stabs.
  - c. Cutting my finger (hand, wrist, arm) by sticking it into the propeller.
  - d. Pre-stretching the rubber motors and weighing them.
  - e. A couple of the above.
3. While driving to the contest site, I mentally prepare myself for competition by:
  - a. Thinking of the reasons which I will use in explaining why I didn't win a trophy.
  - b. Eating.
  - c. Listening to the theme music from "Jonathan Livingston Seagull" on my tape playback equipment.
  - d. Reading MODEL BUILDER.
  - e. Some but not all of the above.
4. When arriving at the contest, I immediately set myself to the task of:
  - a. Talking to all of my old buddies, whom I haven't seen in two weeks.
  - b. Talking to none of my old buddies, because they might want to borrow something.
  - c. Complaining to the C.D. about the entry blank.
  - d. Getting out of the car.
  - e. Very few of the above.
5. After entering the contest, I

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- routinely begin to:
- a. Test fly all of my models from the trunk of the car.
  - b. Borrow from my ex-buddies everything that I forgot to bring.
  - c. Prepare for flight by setting up my thermal detecting equipment and impressing everyone.
  - d. Call "Timer" from as far away as possible.
  - e. Only one of the above.
6. When flying in the contest, I take my turns by:
- a. Timing Junior entries.
  - b. Waiting in line, unless the line is full of Juniors.
  - c. Yelling "Timer."
  - d. Standing in line to complain to the C.D. about whatever is the topic of the day.
7. After the contest is over, I gather for the giving of prizes to:
- a. Get first pick of the goodies.
  - b. Talk to the guys who I have beaten and avoid those I haven't.
  - c. List the reasons which I thought up while driving to the contest (See No. 3).
  - d. Gloat.
  - e. Pout.
8. After the prizes are given out, I usually:
- a. Stick around and help the C.D. get everything put away.
  - b. Stick around and complain to the C.D. about how the contest was run.
  - c. File a protest with the AMA about the unfair way I was treated.
  - d. Get in my car and drive away.
  - e. Suffer heat prostration (in Oregon, suffer water on the knee).
9. On the way home from the contest, I usually:
- a. List the things I am going to do to prepare for the next contest.
  - b. Listen to the tape of "Jonathan Livingston Seagull" played backwards on my playback equipment.
  - c. Take an Excedrin.
  - d. Open the window for fresh air.
  - e. Sneeze.
10. When arriving home after the contest, I usually:
- a. Tell the family how well I've done.
  - b. Take a shower.
  - c. Unpack the car and hide the broken models.
  - d. Swear to give up modelling and take up fly-swatting as a hobby.
  - e. Any two of the above.

A perfect score on this test entitles you to the "Complete Modelers Award." Anyone scoring more than 7 correct should stand in front of a mirror and pat himself on the back. A score of 5 to 7 deserves the applause caused by two index fingers crashing together twice in one second. A score of 3 to 5 deserves the applause of one index finger crashing together once in one second. A score of under 3 deserves five minutes of head hanging while listening to Lawrence Welk's rendition of "Moon over Miami."

Scoring key: The answers are: (not necessarily in order) d, c, a, b, e, e, d, d, a, f.

I think that's enough for this month. In fact, it's gotta be just too much.

Tune us in again in August. In the meantime . . . Happy Thermals! ●

## R/C Report . . . Continued from page 15

this streaking through the sky with the Tee Dee .049 or .051 on it, at 60 to 75 miles an hour, doing every maneuver in the book responsibly, is an amazing sight. Then to see it come in for a slow flat glide, because of the Horner tips, is another amazing sight." Perhaps in a later issue I can tell you how my Pacer flies . . . The fuselage is finished and I plan to get on to joining the foam wing very soon.

\* \* \*

Some issues back, I mentioned the GMP Six Minute Epoxy Glue and GMP told me the response to the "plug" had been nothing short of unbelievable. This epoxy glue is not only a superior product but the amount you get for money is really an eye-opener. Local hobby shop sold out right away. Look for it in your local shop.

Now GMP has a couple of new items to add to their list of products. First is ZIP, an engine additive. Four ounces for only 98 cents, and you squirt a little in the engine venturi before each flying session and it is supposed to cut down carbon accumulation in your engine. Then, after flying, another squirt will eliminate rust and corrosion . . . especially if the engine has to be put up for any length of time. Companion product to that one is Motor Kleen, which is for cleaning the junk and varnish that accumulates on the cylinder head and crankcases . . . strong stuff that will remove that burned-on mess. Sixteen ounces are \$3.49 and will last for many engines. GMP is Gas Model Products, 110 Valley View, Southgate, Ky. 41071, if you can't get the stuff at your local shop.

\* \* \*

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## BRIDI HOBBY ENTERPRISES

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Another subject: Concerning competition . . . now before all you sport flyers turn me off, hang in there for a while and see if this makes sense. First of all, competition is fun and rewarding as long as there is a *chance* of winning. R/C competition becomes lackluster and meaningless to the average flyer when the same winners show up again and again at contests. Now there are those who argue that everyone can win, all you have to do is go out and practice as much as those "pros" do and you can win, too. All well and good, but the majority of the flyers who might compete are strictly Sunday flyers, and regardless of how naturally good they are, they are no match for the practiced pro.

Formula One racing is a good example of an event that started out with some rather universal appeal and the event has narrowed down to a mere fraction of the R/C flyers and in many areas of the country there isn't a Formula I flyer to be found. This, I think, is due to the fact that it takes a souped up engine and plenty of practice to compete, and the average flyer is short of practice and know-how on making his engine turn as fast as the "speed merchants," as they are sometimes called. Quarter midget racing has started out as a sport class but now stands in danger of loss of interest to the *large majority* for much the same reason. Strange as it seems, the engines were intended to be stock, but stranger still is the flyer who shows up and *always* has engines which will turn two to three thousand RPM faster than everyone else. It is grand to win, but the intent is lost in the zeal to win. That is a racing event for the average modeller is no longer average when the winner is using an engine that has been worked on. Hence, by his consistent wins, the hop-up specialist dis-

courages the sport flyer, who thereupon seeks something else and says, with a shrug, "Heck, let the 'pros' have that event, there's nothing in it for me." Probably it would add to my argument to point out that there are more and more Fun Fly events scheduled around the country than ever before . . . this is to enable the average flyer to compete on the same level as the many others and also the pro, if he wishes to join the fun.

The same applies to Pattern. I have long argued that we need a Master Class . . . over and above the Class C or D Expert as the case may be. I fly on Sundays only . . . I work six days a week and have no intention of taking the time from my business and family to spend the endless hours necessary to *try* to put myself in the same competitive class as the "pros." Nevertheless, I can fly well enough to have to enter a contest as Class D Expert. In this area, when four or five of our National Winners and Runners-up show up at a contest . . . there is no way in the world that the rest of the flyers, who fly a little better than the A and B flyers, can possibly hope to win. Therefore, these flyers, who are of championship calibre, should be in a special class (reached by achievement) called, for example, Master.

Contest flying, at least for me, has lost its charm. I enjoy the flying and the fellowship, but although I fly in the same category as these aforementioned "pros," I am not in their class. In local contests last year, it was noted that there were fewer and fewer Class D flyers and more and more Class A and B flyers. This is good, I think, for it shows that the sport flyers still have a place and can compete, in fun, without the grit-your-teeth-do-or-die attitude that often goes with Class D flying.

After all, it is a sport/hobby and when it becomes a chore, there is no fun left in it.

The following statement should cause some controversy but here it is: If the accomplished flyer, the Nationals winner, runner-up, regional winner and Masters competitor were separated in Classification from the rest of the D flyers, there might be some saving of the competitive spirit as well as saving of some events. Probably not fair to the consistent winners, but what about the rest of the Troops, The Majority, the sport flyer who would like to compete but is totally overwhelmed by the pro? End of Soap Box Oratory. ●

### F/F Scale . . . Continued from page 33

extracted from SPORT AVIATION, the homebuilder's guide, and is self-explanatory. Also, how many of you know the procedure most homebuilders use for applying these letters to their creations? Contrary to what you might expect, they paint the registration letters on the wings or fuselage *before* painting the entire aircraft. This seemingly reverse procedure is actually much easier to do than putting them on last. This same method can be used by modelers and should be considered when finishing a gas model. (Wow! Even red numbers on a white background? wcn)

Paint the area where the registration goes with the correct color, and let dry thoroughly. Take some frisket paper (a thin plastic-like paper with an adhesive backing that is used for making stencils, available at most art supply stores) and cut out the letters and numbers. Peel the backing from the frisket paper and adhere the letters and/or numerals to the painted surface. After you have completed painting your model, peel the letters off, exposing clean and crisp registration.





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Obviously, if you like using decal material for registration, etc., these are definitely put on after the model is completely painted. It's a good idea to use Solvaset when applying the decals. Solvaset makes the decal snuggle down and conform to any irregular shape. Another handy product to use over decals is Testor's Dull Cote, which eliminates the excessive high gloss usually associated with decal material. Of course, this isn't necessary if the model is supposed to have a high gloss.

Now, for those of you who like to hand-letter the registration, here's the way award winner Jack McCracken does it. Jack makes one piece stencils for all letters and numbers required as they appear on the prototype. He then takes a very soft lead pencil and traces around the stencil after it has been properly located on the model. He thins out his color enough that it can flow when using a ruling pen. With a straight edge and the ruling pen, he outlines each

letter very carefully (stripes along the fuselage sides are done the same way). When all of the letters have been done, Jack fills in the space between with an appropriate size brush. He even does this on his Peanut models! The results are very gratifying. Roundels et al can be done in a similar fashion, using a compass with a ruling pen in the holder.

I've come up with a system that has worked for me, particularly for rubber powered models. Often, on rubber models that have been covered with colored Japanese tissue, some of the available colors do not make enough of a contrast to use for registration purposes. An example would be orange or yellow over blue. They just do not show up well. An easy remedy is to cut out the letters, let's say, from orange Japanese tissue. Apply them to the wing or fuselage in the conventional manner (I use acetone applied directly over the letter). I then take some Floquil "Reefer Orange" and paint over each letter. At

first thought, it seems like an impossible task, except for one with an unusually steady hand. Not so. Actually, there is enough thickness to the tissue that it leaves a ridge for the paint to follow. Surprisingly, it takes very little time to complete the entire job. This system works well also where the registration, etc., is a color that is not available in Japanese tissue.

Ken Hamilton passes on this next hint for the proper method of laying out U.S. Army wing and rudder markings. These two items are frequently done incorrectly, on both models and full size restorations! The red circle inside the five pointed white star should not touch the inner corners of the star. Instead, it should float within the white star . . . and be of such diameter that it would just come tangent to the imaginary lines which would be formed if the straight side of the star were extended on across to make a pentagon.

As to the rudder, the vertical blue stripe is *always* one-third the maximum rudder chord in width (Many are made too narrow.) Then the rear edge of the blue stripe is divided into 13 equal spaces, for 7 red and 6 white horizontal bars. This formula works regardless of rudder shape, square or rounded.

Last but not least, there will be a few additional unofficial events in scale at the Nats this coming August. The Flightmasters are sponsoring an indoor biplane event (actually it probably should be called multi-wing) for models with a wingspan of up to 30 inches. The regular indoor AMA rules will be used. Another added event will be Jumbo rubber (don't forget the pilot requirement) which will be flown at the same time as outdoor Peanut. Jumbo rubber is also being sponsored by the Flightmasters. These two events are in addition to the already mentioned unofficial indoor Peanut contests, which are going to be held two different evenings, each one being sponsored by the Flightmasters and Scalemasters. ●

**Choppers . . . . .Continued from page 17**  
grab a small boy out of the way when the chopper hit. Fortunately, it was a minor cut, but it certainly points out the dangers of flying *any type* of model near spectators! Again . . . remember, "THEM THINGS BITE!"

Fellas, there are two areas of R/C chopper flying where we need input from the experts! I constantly receive letters from builders who need help in isolating radio problems in choppers. The other area is how to increase chopper "lift-off" performance at high elevation flying fields. In respect to the radio problem, most builders install good equipment, but when that ol' engine fires up, the servos chatter all over the place and control is impossible. There are several basic things we can do; such as

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range checking the radio before starting the machinery up, making sure there are no metal-to-metal contacts or push-rod connectors rubbing together to cause electrical interference, and double-checking each component of the radio (including batteries and switch harness) for susceptibility to vibration. Substitute or exchange components, if possible, to isolate the source of the problem. But, most of us know all this and we still have problems! How 'bout some of you guys giving us your expertise and write some words on what to look for and how to avoid such problems? Each hint or kink will be published, and if you make it a complete and thorough report, we'll print the whole thing under your byline!

As far as the "high altitude" performance goes, it seems we have twice as many "Colorado" choppers as anywhere else, 'cause they all write in and ask, "What can I do to get my chopper off the ground?" Everything works fine for these mile-high pilots, except that they just can't seem to get enough lift! Again, we can say; install a larger engine, increase rotor rpm or pitch, change to a thicker airfoil, build 'em lighter, fly in a wind and don't hover, etc., etc. What we really need is first class information from the modelers who have licked that problem! If you have any ideas, send 'em in and dozens of fellow modelers will love ya for it! It's so frustrating to have this kind of situation and not know where to turn for help. So help, yet! 'Nuff said. ●

**Sailing . . . . . Continued from page 31** on a broad reach. The bow wave becomes a horizontal sheet of water thrown out to each side, and the convergence of the rudder wake is so violent that an actual rooster tail is formed about two boat lengths aft of the transom.

The second place finishing BOOM-ERANG was seeing competition out of town for the first time, and was really on the water for only the sixth time. I built her very lightly and all up weight is only about 13.7 pounds, with keel weight at 8.5 lbs. for a ballast/displacement ratio of 62 percent. However, the stability of the hull is for the most part due to the wide beam carried way aft of the center of the boat. We are carrying the standard 50/50 main jib to ratio as recommended by the builder, L.J. Yachts, 430 Wapello, Altadena, Ca. 91001. And I'm so pleased with the big jib that I may try a 60/40 rig when I get the chance. This boat's forte is acceleration. If I could get a good start, I had little trouble in covering people behind me on the weather legs, and in tacking duels with Jim West's SOLING, I could usually pick up a boat length per tack. Another plus is the use of one of the LITTLE HERCULES winches put out

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to gain a little effective area as well as provide for some "end plate" effect by preventing air from spilling off the foot of the sail. The "duck foot" keel and plumb bow configuration seem to have a purposeful beauty all their own. Though only the 2nd or third time on the water, Schumacher finished a creditable 6th.

A quick peek at the underside of the Aquaplane shows the surfboard like bottom and the large resulting wetted surface. Roy's mains'l wrapped all the way around the mast in a form called double-luffed. We will talk about that style when we cover mainsails in the next couple of articles. The lime-green paint job on the Aquaplane and Roy's English accent combined to see the boat christened "LIMEY". But you should see that thing plane by Harris Engineering, 7628 Dunston St., Springfield, Va. 22151. I'm running it on 9 volts, which gives me full winch travel in about 4 seconds. Fast, but when you are counting on acceleration, your sails must be kept pulling as long as you can.

The third place boat belongs to Chet Purdy of Germantown, Maryland. This one is the third in a series that Chet has done the design for from keel to mast step. Note the plumb bow. He says the waterline length (LWL) is 50 3/16 inches. It is new this season, and I'm afraid that when YANKEE is

finally on her stride, we'll all be sitting in her wake. Chet is a good example of what patient development can accomplish when a full measure of time is taken for evaluation in all wind strengths and sea conditions. We don't know who will be sailing it, but YANKEE will definitely be competing at the AMYA 50/800 ACCR in Toronto this August 10th and 11th. She'll be up near the top at the final gun too, mark my words.

Fourth place was claimed by Larry Goodrich with a design of his own converted from a vane-sailed format to R/C. In his association with the "set-them-up" and turn-them-loose" variety of vane sailing, Larry has provided the maximum amount of adjustability to his rig as you can see from the deck outfitting. The boat weight was in the region of 22 pounds or so, and once she got to steaming, looked like a juggernaut. But when forced into tacking, or in the pre-race maneuvering, the low acceleration proved somewhat of a handicap. Of course, one must expect a trade off between acceleration and momentum, and it will be decided by what kind of air you routinely expect to sail in. I kidded Larry about whether he took inventory of his floating hardware before or after the season, or both times, to see if he lost any parts in competition. The second photo shows the cut-away fin keel with attached bulb, but

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only gives a hint of the rudder hung behind a skeg rather than a counter-balanced one so prevalent in the newer boats. Larry's son Neil acted as tactician for his father and looks to be another of those dratted, Whiz Kids who keep giving us older fellows such a hard time on the lake.

The eventual fifth place boat was a stock SOLING skippered by DVMYC Club Contact Man Jim West. Prior to the start of the racing, he demonstrated an uncanny ability to move his boat directly to windward in complete defiance of the laws of physics. Well, it turned out to be in complete defiance of the laws of AMYA too, for as a joke he had suction cupped a small power pod onto his hull aft of the keel and was in reality motoring into the wind to the amazed, and horrified gasps of the assembled skippers. I for one really got a kick out of the trick, and I'm sure the next stunt pulled will be even bigger and better.

So, with a good cross section of boats making up the Garden State Fleet, we can see that each type of vessel . . . homebrew, kit, designed-for-R/C, or converted-from-vane . . . when equipped with a modern day skipper, can acquit itself well in racing. I might add that the variety of boats to look at between races is a hobby all in itself.

To change the subject, remember that another AMYA class is run on a formula basis similar to the M's. This is the 36/600 class. The difference is that the 36's are wide-open . . . no roach limitations, multi-hulls such as catamarans are allowed, the sky is the limit.

We are presently outfitting a HUDSON 36, for our youngest to sail. This little gem is made to look like an ocean

racer with the fine bow and fat stern that the IOR MK II rule has evolved. How she will do in competition we don't know. Ours will feature a bulb keel for added stability, and a fully battened Hobie Cat style main which will take her sail area up to almost 750 square inches. The photo shows one of the factory prototypes, and hulls should be available by now from Leisure Products, Div. of Model Masters, 6920 Braddock Road, Annandale, Virginia

Next month we will launch a two part discussion of mainsails. Questions will be fielded by writing to Rod Carr, 7607 Gresham St., Springfield, Va. 22-151, or in care of MODEL BUILDER.

Remember to send in your \$5.00 annual dues to AMERICAN MODEL YACHTING ASSOCIATION, 4761 Niagara Ave., San Diego, Ca. 92107. The Quarterly Newsletter is worth twice the price. Over 200 individual events are planned by AMYA for this season. I know . . . I was the fool who got the hat that said "REGATTA SCHEDULE COORDINATOR" on it. ●

### R/C Cars . . . . . Continued from page 49

Now I'll tell you how I like the steering override setup. First I don't like the override to release . . . even at high speed. I like to have some high speed understeer, but only that caused by aerodynamics. Second, there should be some "slop," or dead band, in the system. I like front end caster to provide straight line steering down the straight-aways. I start by putting in a high steering override preload, but one that is still safe for the servo. The deadband is provided by a loose servo, linkage free motion, or a light spring override with limited motion. Figure 2 shows a front

end linkage arrangement using a Thorp (Delta type also) override and a DuBro override. The Thorp override provides the "servo-saver" action and the DuBro override provides the weak deadband. Stiffer override action is obtained by connecting the linkages to the holes closer to the bellcrank pivot. I set the front end steering motion so that the low speed turning circle diameter is about four to five feet in both the right and left directions. Figure 3 shows an Associated/HRE installation at the front end. The override preload can be varied by bending the arms which extend to the front end cross linkage or by putting rubber bands around the output bell crank arm. System deadband is provided by linkage-free motion and the bend in the linkage between the bellcrank input arm and servo.

The throttle/brake linkage is a little more difficult because of the two outputs required. First, I will describe how the setup goes for a Deans radio, which I use, and then for other types of radios. Figure 4 shows a schematic of the servo output during throttle "trigger" motion. On the Deans radio there is a mid-throttle position when the throttle trigger is released. The throttle trim adjustment does not affect either the full throttle or full brake motion position. Also shown in Figure 4 are the motions used for throttle and brake actuation. Note that there is a slight throttle-brake overlap. The throttle trim range is really used to adjust in the amount of brakes desired for various tracks and conditions. If I really get in trouble, the rear brakes can be locked up, however, car control then goes to pot.

So, the general setup procedure is to first set the throttle trim toward the full throttle position. With the trim in this position, set the throttle at complete idle (whatever idle speed you desire or require). Moving the trigger to full throttle, check to see that the carburetor is full open. Vary the arm length on the throttle servo until full open and idle carburetor settings are attained with this trigger motion. Now go to the brake, leaving the trim toward the full throttle side, and set the brake linkage so that there is a light brake action. Now pull the trigger so that you have about 1/3 throttle opening and check to see that the brakes are fully released. If the brakes are not fully released, the linkage will have to be readjusted or some of the system springness taken out. Move the trim all the way toward the full brake position. At this trim point there should be very strong braking action, slightly more than you would normally want during driving conditions when you are on the track alone. The extra "trigger" motion when you push it is for lockup brakes, or harder brakes, when something happens during racing situations.

There must be a spring type override on the throttle to allow servo motion from the carburetor idle position to the full brake servo position. This spring can be very light because no force should be required for carburetor positioning. Also, the heavier the carburetor override spring, the less force there is available for brakes. Under no conditions do you want to stall the servo. There should be a heavier spring action in the brake linkage, again to not stall the servo, but stiff enough to give full braking force.

Figure 5 shows a schematic of direct throttle and brake actuation from the servo which is near optimum. The reason for this is that during braking action the brake arm motion gets extra leverage by having the brake servo attachment point moving at an angle. In this way, servo arm motion is greater than actual brake actuation motion, hence there is extra leverage. During throttle motion, both the brake and throttle actuation motions are greatest to attain full brake release and full carburetor opening. Figure 6 is a photograph of a throttle/brake linkage setup which attains the desired geometry. The carburetor spring override is easily seen and the bend in the brake linkage arm provides the override action on the brake side.

For the actual brake configuration, I recommend a rear axle brake (keep the clutch bell cool) which was discussed in an earlier article. Also put lining on both the drum and the brake band.

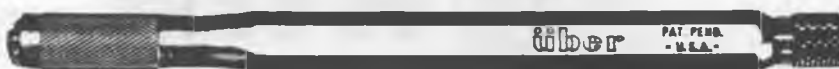
A yellow asbestos on the band and "Unobtainium" (a cork asbestos mixture) on the drum is about the best I have seen to date. A close second is to use cork on the drum and the yellow asbestos on the band. Wrapping the band half way around the drum will be O.K. with some servos, but more self-energizing will be attained if a 3/4 wrap-around band is used. Time must be spent to get the brake to release fully at partial throttle, or high clutch wear and a speed reduction will result.

Now for other radio setups on the brake/throttle linkage. Many radios, particularly the converted stick type, do not have a mid-servo position trim. On these radios the maximum brake trim position is also the "trigger" stop. All that has to be done, and can be done, is to let the maximum brake trim position shown in the schematics be the maximum brake position. Less spring action in the brake linkage may be required, and lockup brake conditions may not be possible.

#### EDITORIAL

Before the 1974 R/C Car Nationals take place and the annual ROAR meeting is held, I'd like to throw out a few things for all racers and ROAR members to consider. The three things I'd like to discuss are rules changes to a car class, new driver classification, and recom-

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mended 1975 national racing classes. All of these items are to stimulate interest, increase participation, and keep old racers coming back, as well as attract new or different people.

\* \* \*  
Concours cars have only attracted a few people. With some rules changes I think this class might attract more and different people. Basically what I propose is to split the points awarded to a car into three categories; 1) external appearance, 2) engineering and internal appearance, and 3) performance. In a way, this sort of parallels what is done with model airplanes. Each individual could then concentrate on what he thinks is the best combination to win. We might even see some real competition cars appearing in the concours class, and vice versa. The judges would rate each car on the basis of 100 points maximum for the first two categories, and a race time for 5 laps (scaled to 100 points) would be used for performance. Hence a car could get 300 points maximum.

I think the first two categories are self explanatory. For the performance category, the time would be determined in a heat race event run after judging in the first two categories. Each car would be in one 5 lap race with 4 to 6 cars in each race . . . determined by draw. The car with the lowest time would receive 100 points. Points would be awarded to other cars by inverse time scaling. A car which took twice as long would get 50 points ( $100 \times 1/2$ ), or three times as long 33.3 points ( $100 \times 1/3$ ). The points total of the three categories would determine the positions, with higher points winning. In this class, neat appearing competition sports cars and formula cars could enter. If a road or oval course were used, the dragsters would not be likely to enter, but maybe some future rules changes could make them competitive in the proposed concours class.

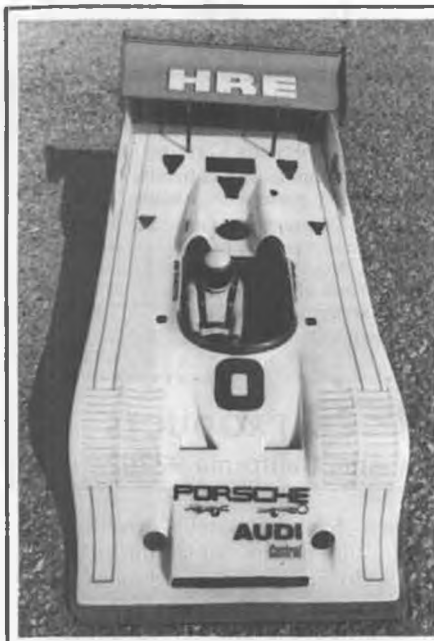
\* \* \*  
I have always been a little unhappy with the Amateur and Expert driver classifications, particularly at the Na-

tionals. Many Amateur drivers should be in the Expert class, and vice versa. Some drivers stop running in local races so as to not accumulate sufficient points to win in local amateur series races. In this way, when they go to the Nationals, they will still be in the amateur class.

Some time back I proposed a carburetor size limit as a means of car classification. Presently I feel that a fuel limitation is also required to keep the competition even in the new class. Normally, as drivers get better they want to go faster. So in local races, I would propose Beginner, Intermediate, Stock, and Open driver classes. In the Beginner, Intermediate and Stock classes, the throttle bore and fuel would be restricted to say .156 inch diameter bore and 10% nitro respectively. There would be no such limitations in the Open class.

Now, as a driver gets proficient, he progresses from Beginner to Intermediate, and then to either Stock or Open class, or both, as he desires. With the carburetor and fuel limitations, I feel that any car will be competitive in the Stock class. Engine porting and timing changes have a smaller effect, but blowing engines would seldom occur. Chassis design is not critical and use of differentials, suspension, etc. will not really help.

With this system, the guy who does not want to put out mega-bucks can run competitively and use the same equipment for years. Since the cost of a car will be lower, more people will remain active and participate and possibly want to move up. Now at the Nationals, the two classifications that would be run are Stock and Open. I think here that a driver must select only one of these classifications to compete in. There is no longer a question of driver ability. I would expect that an Open class win would carry more prestige, so that factory sponsored drivers would be in that class. However, if they were in the Stock class, a smaller amount of dollars would be required for Joe Average to be competitive.



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Again, the carburetor-fuel limitation suggestion is based on current NASCAR and model airplane practices. With these limitations, we might even see .15 cubic inch engines used, similar to the small block engines coming back in NASCAR. The fuel restriction is similar to some International (F.A.I.) model airplane classes. This restriction will tend to keep the competition even and eliminate blown engines while using 50% nitro, or whatever. At the Nationals, I'm sure we could get fuel manufacturers to provide fuel that is 10% nitro. The carburetor bore size could be checked with a "Go-No Go" type gauge that is forked to get around any spray bar that may be present. Spray bars could be filed down or eliminated if desired. I'd be liable to use the K&B .15 Schneurle port engine, since it puts out about ten percent more power than the Veco 19.

\* \* \*

Right now I would like to state that I think stock cars should be run at the '75 Nationals. This is the only 1/8 scale car class that has not been raced at the national level. In 1/8 scale, both the Formula (or Indy) cars and the Stock cars sort of take a back seat to the Sports Car during the year. Consequently, at the Nationals, we probably should alternate the years that these classes are run . . . even years for open wheel cars and odd years for the stockers. The stock cars could either run the road course or an oval track. This decision would be made by the competition committee.

I would like all racer/ROAR members to think about these ideas because I intend to present them to ROAR at the annual meeting, if possible. They will also be presented to the rules and competition or race committee as well as the officers of ROAR. The suggestions are made with the objective of in-

creasing participation by the many people who drop out of racing because of dollars, or who like to play around with new ideas.

If you have comments, suggestions, questions, or desire copies of previous articles, please write to me: Chuck Hallum, c/o HRE Inc., P.O. Box 4658, Irvine, Calif. 92664, or c/o MODEL BUILDER. Have fun in your racing and be at the '74 Nationals. ●

### R/C Pylon . . . . Continued from page 23

At this contest I noticed many new faces, some that I recognized as Quarter Midget flyers who before this race had never entered Formula I. Everyone is very glad to have these people join us in what we feel is a most exciting event.

Actual racing started at 0920 on Saturday, and immediately, everyone witnessed the first tragedy, a mid-air at No. 2 pylon. Because of this, many felt this was going to be a contest that would cost many planes. However, quite the opposite was actually the case. In the past, this race has cost between 25 and 30 percent of the planes. (They are now parked at the big model airport in the sky.) However, at this contest, I only counted 11 planes snuffed in the ground. (They now own a piece of the rock.) Out of 104 entries, this is hardly more than 10 percent; not bad for a "dangerous" sport. Personally, I attribute this to the safety inspection, and the figures I have been keeping are starting to bear this out. At this contest, the safety inspection was conducted by Ron Schorr and Jack Lee, two fellows who know exactly what to look for, and they did a very good job . . . very quickly also.

Let's get on to some of the racing highlights.

The first round in Standard Class showed everyone there was going to be some very keen racing. Joe Howard,

coming out of retirement after two years, in the Standard Class, promptly demonstrated with his Ricky Rat, built by George Templin (a newcomer to Formula I) that he would be tough to deal with. First roll of the dice produced a 1:28.5. Not bad for a rookie! Joe flew an absolutely stock, out of the box, uncustomized K&B Schneurle. Joe is a personal friend of mine and I can verify this.

Next up, after some difficulties at the first race of the season, was Bobby Johannes, and he also demonstrated his ability, to the tune of 1:26.0. Right away he took serious command of the situation. Throughout the entire contest his times were consistently in the very low 1:30's. Tony Lopez was next to prove his worth, and he did it in true style with a 1:28.0. He did this while racing Joe Howard when Joe turned his 1:28.5. Keep in mind, I am talking about the Standard Class now. Lopez was the only person to beat Howard at this contest, and this came about on the last lap in the 2-3 turn.

After three or four rounds of serious flying, we found Howard, Silverman, Johannes and Merl Hoem in a tie for first place. Silverman and Howard each took a second, which allowed Johannes the lead. However, Johannes fell to a bad needle setting in the last heat. This produced some strange circumstances, and it proved quite interesting. With Silverman and Howard taking seconds, this allowed Robert Johannes, Bobby's father, to sneak in and produce another three way tie after all the rounds were flown. After some real quick radio borrowing by Silverman, all three were lined up for what was certainly going to play a very interesting part in the Standard Class, a flyoff for first place, something that has never happened in the past in Standard. Lot's of excitement was surely coming.

All three flyers elected not to use the race horse start generally used in flyoffs, primarily because of the wind that was coming somewhat across the field. Joe Howard would be first, followed by Jerry Silverman, and Robert Johannes. Plane identification was first, then Jerry Christenson's announcement, "Gentleman you have 90 seconds to start your engines." Promptly the engines growled into life, and all three were running. Radios were checked, needle valves were set, and the flyers hurried to their elected spots. Callers George Templin for Howard, Bob Smith for Silverman, and Bobby Johannes for his dad signified they were ready. Christenson then checked with the pilots and they declared they were ready with the traditional nod of the head. Presto, the flag was down and Howard's Ricky Rat was off closely followed by Silverman's Super Dara and Johannes' Minnow. The first turn at No. 1 found Silverman in the lead, with Howard on his tail. Johannes was somewhat behind. During the ensuing ten laps, the Rat and Super Dara exchanged the lead several times. The Dara would be around No. 1 first, but the Rat would get it back at No. 2 and No. 3. The Stafford Minnow was fast, but the pressure was entirely too much for Johannes, as I have been told that he was only going two thirds the way down to No. 1 pylon and had acquired many cuts there. The end result found Joe Howard the victor with a 1:27.0. Johannes had cut out and Silverman planted his Dara at No. 3 on the tenth lap. Silverman did have the fast time so he took 2nd, and Johannes third. Very exciting race that will be very hard to out-do, at least in the Standard Class, for some time to come. Congratulations Joe and George. Robert Johannes, please pull out when you double cut.

#### AND THE EXPERTS . . .

The Standard Class had its shakeups, but don't think that the experts just sat by idle. In the very first heat, Terry Prather again proved that the Super Tigre X-40 engine is certainly the most powerful of all, however, as much as I hate to say it, it just doesn't want to run all the time for Terry. In the first rattle out of the cage, Terry again set another new record, this time 1:15.7! All of his times were very close, however in the fourth round, while coming out of Number One, the engine flamed out and certainly cost him that heat, and possibly the event.

Jim Jensen and Joe Vartanian were also running these engines and going like lightning, but because of thumb glitchitis, couldn't put it together.

After four rounds we found Charley Shaw, flying a Super Dara, in first place, tied with Jeff Bertken, Bobby Smith, and Kent Nogy . . . Almost unbelievable. Somewhere after the fourth

round, Shaw took a zero, Johnny Brodbeck beat Bobby Smith, and Ed Foster laid it to Kent Nogy. Ron Neff put Bertken in a tie by posting a 1:16.5, and this now set the stage for the experts.

Much had been accomplished by this time. Jeff Bertken had become the first K&B flier to break the 1:20.0 barrier. Ron Neff, flying Glen Spickler's Minnow design, was the first Northern California flyer to break 1:20.0. Before this contest he was flying in the very low 1:30's. Quite interesting, as this is the first time Ron had flown this plane in a contest.

Something very interesting about Bob Smith. He also went quicker than he ever went before. He was the second K&B flier to go below the magic mark. His time was 1:16.4. Keep in mind this time is only seven tenths of a second behind the time that Prather turned . . . and Smith's engine never quit. From my observations, Smith was flying much tighter than he has at any other event, at least in the past two years. On the other hand, Terry Prather flies a wider course than Smith, Leonard, Nogy, and Bertken. It would be interesting to see if Smith could fly his usual tight course with Terry's screaming X-40 up front. If he could, we might see the first 1:10.


All this rambling boils down to one thing. By the end of the last round of heat flying we had Bertken and Nogy tied for first. This is the same thing that happened at the first race. The only difference was the end result. This time Jeff Bertken spelled it all out. He wanted to beat Nogy, and that is exactly what he did. For ten laps they battled the 1320 ft. course nip and tuck, with Bertken ahead most of the time, however, Kent was right on his heels. End result. Bertken first, Nogy second.

Congratulations Jeff, this is the first contest since I have been flying that he has actually taken first place, and I can't think of a better place to do it than Bakersfield.

There were a lot of very interesting things that happened at the Bakersfield race, and they were all different. Let's look at a few: 1. Johnny Brodbeck beat Bob Smith. 2. Kent Nogy beat Smith. 3. Nogy beat by Ed Foster. 4. Nogy beat by Bertken. 5. Neff beat Bertken. 6. Bertken, Smith, Neff were the first K&B fliers to go under 1:20.0. 7. Terry Prather goes 1:15.7. 8. Most K&B's used Rev-Up Custom Series 400 B props. 9. The only K&B's to go under 1:20.0 all used these props, all were stock . . . Neff's not even balanced. 10. Ron Neff used 65% nitro, all the rest used straight 60%.

Put all this together and what have you got? All in all it made for a very exciting weekend that will not be outdone for some time to come. Entrants for this contest came from all over the

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west coast (including Mexico), and from as far east as Maryland (Bob Violett). Nevada, Arizona, Washington, and Oregon were also very well represented.

This was, beyond any doubt, the finest contest I have ever been to, and I hope that many of you will be there next year.

The planes in attendance were as follows:

Dara's . . . . .	36
El Bandito's . . . . .	21
Minnows . . . . .	16
Ricky Rats . . . . .	11
Little Toni's . . . . .	5
LR-1As . . . . .	6
Cosmic Winds . . . . .	3
Thunderchickens . . . . .	3
Dallas . . . . .	2

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All of the top ten in Standard were using K&B Schneurle engines.

The NMPRA salutes the Bakersfield BARKS for a job well done.

Don't forget the contest at Las Vegas on September 21-22, 1974 . . . Formula I at it's best.

## RESULTS

### EXPERTS

1. Jeff Bertken	Super Dara	K&B
2. Kent Nagy	LR-1A	K&B
3. Bob Smith	Super Dara	K&B
4. Ron Neff	Minnow	K&B
5. John Brodbeck	Toni	K&B
6. Dan McCan	Super Dara	K&B
7. Terry Prather	Little Toni	ST
8. Charlie Shaw	Super Dara	K&B

### STANDARD

1. Joe Howard	Ricky Rat	K&B
2. Jerry Silverman	Super Dara	K&B
3. Robert Johannes	Minnow	K&B
4. Merle Hoem	Rat	K&B
5. Frank Szekula	Unknown	K&B
6. Steve Sica	Rat.(Scratch)	K&B
7. Richard Governale	Minnow	K&B
8. Bobby Johannes	Minnow	K&B

**SHRIKE . . . . .** *Continued from page 13*  
dia. x 1/8 inch long pieces of tubing to the 5/16 dia. ring, 90° to the center bearing. Use a 1/16 drill to clean out any solder that might have gotten inside. Cut and bend a soft piece of 1/16 wire and install through hole in center bearing. Solder in place as shown. Glue the head on bent end of wire with silicone cement and let dry. Epoxy lead weight to other end of the 1/16 wire. Check that the weight is large enough to pivot the head on the "gimbal." Mount the gimble/head assembly with 1/16 wire pins. Drill 1/16 hole in the

collar just so the gimble can not be seen. Epoxy pins in place. Now make a simple body as shown in the detail and glue pilot assembly to it with silicone cement. Paint assembly, using dull black. Paint as per Williams Bros. instructions. Epoxy a plywood tab and mount with small wood screws. Lubricate gimbal with Vaseline or use a silicone spray so it moves freely.

### WHEEL FAIRINGS

Study this detail and make a right and left assembly. The left assembly is shown. Make two sets of bulkheads of 1/4 inch balsa. Glue these to the front block and trailing block, noting the slant of the top bulkhead. Glue the 1/16 skin on next, running the grain 90° to the bulkhead at section B-B. The bottom former is hardwood, as it is the support block. Glue these in place. Trim the wheel contour and add a 1/32 inch plywood doubler with an 1/8 inch overhang. This both stiffens this area and will support the wheel cover assembly. Make the wheel cover assemblies . . . balsa blocks in the front and 1/16 inch plywood sheet for sides. Note the three attach points. The front point is a 1/32 plywood clip. Use 1/8 inch dia. tubing for guns. The lower gun fairing is soft balsa. Carve to shape and glue in place. Slip the wheel fairings over the landing gears. Install the wheels and check for wheel clearance. When all is clear, glue the fairings to the wing. Make fillets of Epoxolite.

### HATCHES & WIND SCREEN

These were made of 1/16 inch plexiglass. Make the wind screen from template. Leaving the paper on, mark the bend lines on the paper backing. Heat the plexiglass with a torch at the bend lines and bend to fit the cockpit. Install

on the fuselage and epoxy.

The canopies were made over forms of the radius shown. Trim and install the stationary canopy to the rear cockpit. Install a 1/8 sq. spruce rail along the edge of the cockpit from No. 5 to No. 8 bulkhead. Make up the moveable canopy per detail. Four clips hold the canopy to the rails. The wind deflector is .020 inch aluminum sheet cut per detail and epoxied to the canopy.

### MACHINE GUN

The observer's gun is a 1918 M-1 machine gun. There's nothing special about this assembly. The body is spruce . . . 3/16 inch dowel and balsa block for ammo container. The sights are tubing of different sizes. The cross hairs in the main sight are pins. Holes were drilled in the brass rings and pins installed and soldered. The post is 5/32 inch tubing and a collar is used so the assembly will not fall out in flight. Paint dull black.

### STRUTS

Assemble the fuselage and wing and make the strut assemblies shown. Struts are shown true length. Sand them to streamline shape. Set them on your model and trim to the wing contour and fuselage shape. Mount 1/8 inch dowels through the strut at the wing contact point. Drill into rib No. 3 on the spar location, just 1/4 inch deep. Now we have the fuselage location. Glue a plywood doubler inside the cockpit opposite the point. Drill for a 4-40 screw through strut, fuselage skin, and plywood doubler. Mount a 4-40 blind nut in fuselage. Make Epoxolite fairings at the 3 points. Sand to a streamline shape and install the single struts from the wheel fairings to the fuselage fairing on the wing.

### FLYING WIRES

Make up flying wires to the point stated. These are made from .020 music wire. Make eight small spruce blocks 1/16 x 1/4 x 1/2 inch long. Trim them to a streamline shape. Make two spruce blocks for the wheel fairings 1/16 x 3/8 x 1/2 inch long. Make spruce blocks 1/4 x 1/2 x inch long for mounting at station No. 4. Make the bottom assemblies first. Determine the angle the wire will intersect the wing from the wheel fairings, then chamfer the block to this angle. Epoxy the blocks to the wheel fairings at the proper angle. Drill the .030 dia. holes with a pinvise in each wing block 3/16 inch apart, and drill two holes .040 dia. in the wheel fairing blocks 3/16 inches apart. Make the spreader dowels as shown. Drill .020 holes to slip wires through. Measure and cut wires to length. Epoxy wires into wing blocks only. Set assemblies aside. Build a fairing of Epoxolite on the wheel fairing blocks.

Make up the top assemblies the same way, but don't epoxy the wires to the fuselage blocks. The model is com-

pleted before the final assembly to these wire details. When the model is completed, epoxy the bottom wire assemblies to the wheel fairing blocks. Pin and epoxy wing blocks in place. Mount the wing in the fuselage and block up plane at the wing tips. Pin and glue top wing blocks in place. When dry, epoxy wire into fuselage blocks. Holding wires tight, drill for 4-40 bolts. Install 4-40 blind nuts. With Saran Wrap on the fuselage, make epoxolite fairings on the fuselage blocks. When dry, sand to streamline shape and paint. Touch up wing blocks with yellow paint.

#### PAINT

At this point we have quite a lot done. Pick out the A-12 from the profile that you wish to copy. I did the old No. 17 of the 13th Attack Sqdn., 3rd Attack Group, 1935. Pactra Cub yellow works quite well. The olive drab is on the green side, so this should be mixed, 2 parts Stinson Green, 4 parts Cub Yellow, 1 part Stearman Red. This is pretty close. Use dull gray for the collector ring, cowl white and cockpits aluminum.


#### GENERAL DISCUSSION

These details were added last; refer to drawing for location: Make the radio mast from 1/8 x 3/8 straight grained spruce. It is 5-3/4 inches long and tapered to 1/8 inch at the top. Sand to streamline shape. I drilled a 1/16 inch dia. hole up the mast about 1-1/2 inches and drilled an intersecting 1/16 hole from the rear. This is to get the radio receiver antenna to the outside. Install as shown and epoxy in place.

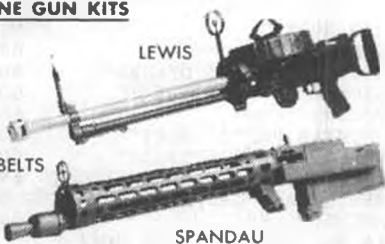
The instrument panel is only reference. I did not have this information, nor for the radio in the observer's position. The instrument panel is 1/16 plywood painted dull brown. The instruments are Tatone . . . 7/16 inch for bank & turn, compass, altimeter, air-speed, fuel. Oil pressure, and oil temperature are 3/8 inch instruments. One aluminum panel has three green and three red pin heads for lights. Another horizontal panel of aluminum is for five switches.

The scale radio is made of aluminum sheet bent to shape. The dials were drawn on stiff paper and glued in place. The tuning knobs are rivets cut short and cemented in place. The grids are made from pieces of screen. The one on the top was for cooling, the one on the front was a ground speaker. The head phones are made of 2 narrow brass strips soldered to 3/16 dia. washers. The head phone cups are large blobs of black silicone cement. The coil of wire from the head phone to the radio is formed by wrapping a length of coated wire on a nail. Cockpit vent is made of aluminum painted O.D.. Inspection door is of aluminum, painted red. The observer's step is made from 1/16 wire, and the pilot's gun


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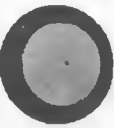
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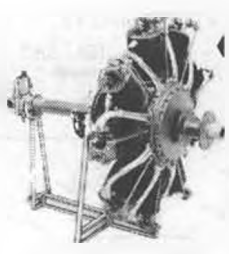
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sight is made of 1/8 tubing. Running lights are 1/4 inch dress pins with balsa fairings. Stars on the wings, bar and stripes on the rudder, "U.S. Army" painted black on bottom of wing (See "F/F Scale" this month). Wing walks painted dull black.

Now it is a couple of cases of beer later; five, or was it ten bandaids . . . I'm pretty wild with a model knife, and it is finished.

#### FLYING

U-Control: The model was flown U/C first. Make sure the balance is on the front line. The radio servos and battery were left in the plane. The aileron servo was set with an 1/8 inch deflection for a right turn. The rudder servo was set 1/4 inch for a right turn. As a matter of fact, I pinned it. The tail wheel was set to get a slight right track. Note: That was why separate push rods were used. The throttle rod was the one used for U/C. The elevator link was installed and attached to the elevator push rod with a 5/32 collar. The flap link was attached.

Adjust the engine for good high speed and good idle. Do not attempt to fly the model until these can be done with little effort on the 3 wire handle. Also pick a good day with very little wind for the first flight. Taxi the plane two or three laps to make sure the tail wheel is set correctly, because without tension on these lines at slow speed engine control, you will get in trouble. Now fly it!

#### RADIO CONTROL

Take out the U/C plate and remove the line guide on the wing. Install the R/C throttle push rod. Install the receiver. Set up all servos and adjust the rudder and tail wheel to neutral. Balance the plane as shown on the plan.

Again make sure of the engine high speed and idle adjustment. Try it on a good day with little wind. Run some medium speed ground tests to get the feel of the rudder and how quickly the tail comes up. The tail has to come up before flying speed is reached. Now fly it. I live just outside of Aspen, Colorado, and our flying field is at 7500' elevation, so take-offs and landings are hot. ●

#### LEO . . . . . Continued from page 26

pieces of 1/16 x 1/4 rib strips curve gently over the main spar at criss-crossing 45° angles, forming an extremely light and rigid structure. Of "flying stab" configuration, the two halves plug into the wire tongues coming from a Kraft control horn.

The stab mounts on top of the fuselage, but because the fuse is quite small in this area the stab tips hit the ground long before the wing tip, when the glider leans over while at rest. This puts quite a bit of strain on the stab, even at rest, to say nothing of the beating it could take on anything but the smoothest of landing surfaces. We'd recommend adding a wire and/or sheet balsa (vertical grain) skid which would raise the rear of the fuselage enough to keep the stab clear of the ground. This worked well on the JP Dart II, where a loop of 3/16 brass tubing was installed.

Most of the vertical stabilizer moves, providing plenty of turning effort. The rudder is also aerodynamically counter-balanced to ease the load on the servo.

The fuselage borders on the edge of conventional construction, employing sheet balsa sides, top, bottom, and bulkheads. The top, aft of the wing, is curved, being covered with 1/16 sheet. The entire top front end, from the trail-





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ing edge of the wing to the nose, is removable in one piece. Bottom of the removable section is a 1/4 inch ply sheet, and built onto this is the canopy and the center section which holds the maple wing tongue. We feel it is a good idea to add a hardwood block which would be glued and screwed both to the 1/4 inch ply base and the maple tongue, in order to make this a strong, one-piece unit.

This unit is held to the fuselage by an 1/8 inch ply tongue at the rear, and a wood screw in a 1/8 inch ply plate at the nose. Again, considering the loads imposed on this unit, particularly during two launching and when attempting to break out of strong lift, we epoxied a block of hardwood under the main fuselage rails and drilled and tapped it to receive a machine screw at the front end.

The entire fuselage is covered with up to 2 ounce fiberglass cloth and resin followed by painting with Hobby epoxy or K&B epoxy paint. The wing, stab and rudder on our test ship was covered with a mile and a half of transparent orange and/or white Monokote, and 14 ounces of ballast were required in the nose for proper balancing. Total weight, with Kraft radio aboard is 8 pounds.

Phil Bernhardt built and test flew the Leo and made the changes recommended. He also recommends the fol-

lowing: Sheet the inboard wing panels at the root, tapering the extra sheeting from the first rib out at the trailing edge, to the 3rd rib out at the main spar. Add filler blocks to the inside of the removable fuselage top block to provide carving material when blending the top with the rounded cross section.

Phil goes on to say that the quality of wood and the machine cutting of parts in the Leo kit is excellent, and considering today's cost of balsawood, the introductory price of \$99.95 for the kit is worth it for the wood alone.

Phil also reports, "Flying the Leo is a lot of fun, but it is not a beginner's ship (obviously). It will thermal in the lightest lift, and because of its size, it can be seen even when flown to very high altitude.

"Landing approaches with Leo are made hot, and when the nose touches down, full down elevator must be used to hold the airplane on the ground. The rudder is still effective, and the glider must be steered to a stop. Leo has much more momentum than most gliders, and if landed on grass it will slide along forever!

"Before building a Leo, one should make sure of having a big enough place to build and store it, and some way to transport it. (Phil carries his in his Volkswagen . . . with the right seat removed! wcn) Also, a special super-strong hi-start

is needed to get it up. This will be available from Craft-Air in the near future."

Counter . . . . Continued from page 7

dimensions are 16 inches long, 14 inches wide, 5 inch high at the sides, and 10 inches high at the handle. It holds a lot.

Astro Flight, Inc., 13377 Beach Ave., Venice, Calif. 90291, which has pretty much pioneered electric powered model flight, now has a new small motor, the Astro-05, for use with props like the Cox 5-1/2 x 4.

Special nickel cadmiums used with the 05 can be charged from your automobile's cigarette lighter receptacle in 15 minutes (At last, a use for this device provided "free of charge" for non-smokers by the auto industry! wcn). Normal powered flight provided by this combination is 5 minutes, though with proper selection of prop and a well built light model, the time can be increased to 8 minutes.

Astro Flight is also offering a series of accessory items to go with its electric motors.

A switch harness/cord clip (\$5.95) contains a 3 foot long charge cord with alligator clips to convert your motorcycle battery to a charger, a 10 amp heavy duty motor switch, and a female power receptacle for your model car, plane, or boat.

A deluxe rapid charger (\$24.95) provides quick charging for the Astro-05 and Astro 10 marine nickel cadmium batteries from your auto cigarette lighter receptacle. The ammeter allows you to check battery condition and a 15 minute timer prevents overcharging.

An auto charge cord (\$5.95) includes a 6 foot charge cord with cigarette lighter plug, a 10 amp motor switch, and a female receptacle for your model.

A 12-volt wall charger (\$8.95) is designed to charge any 12-volt motorcycle battery such as used with electric starters or the Astro Flight electric field box.

A new, wide range electronic/optical tachometer is now available through BWT Systems, 4523 Keeler Dr., Columbus, Ohio 43227. The "ACCUTAC" has 10 ranges covering 0 to 30,000 rpm in 3000 rpm steps plus two broad scales of 0 to 6,000 and 0 to 30,000 rpm.

The solid state tach incorporates 4 integrated circuits (the equivalent of 83 transistors) and achieves an accuracy of plus or minus 1 percent. The list price of \$79.95 includes a one year warranty on parts and labor.

Sig Mfg. Co., Montezuma, Iowa 50171, will soon be releasing a kit for Tom Stark's 1973 Nats winning rubber scale model, the Monocoupe. Kit will include building and flying instructions with plans, molded plastic prop, wheels, Sig contest rubber, die-cut parts, covering material, and decals. Price of this

24 inch span model, is unannounced.

Glad to see that Ted Strader is getting back into the action after a lay-off of several years. The first offering of his Special Edition Plans, P.O. Box 2555, Schenectady, N.Y. 12309, is his well-known 60 inch span GYPSY, a powered R/C sailplane for .049 engines.

The kit, which retails for \$23.95, includes complete die-cutting, and serves as an excellent first-airplane trainer for single channel pulse or light 2 channel equipment.

**Gulfhawk . . . Continued from page 21** aviation school in New York City. The Curtiss was in deplorable condition, with many parts missing, but Tallman was not deterred from rebuilding the famous oldtimer. He replaced the missing structure, reskinned the fuselage, and installed a Pratt & Whitney Wasp of 650 hp, along with the prop, wheels, tires, brakes and other parts from a North American SNJ.

For a time, the Gulfhawk IA was on exhibition in Tallman's museum, but in 1968 it was sold at auction to the Wings & Wheels Museum, Santee, South Carolina. At last report, it is still there, although it is scheduled to go to the Smithsonian NASM to join its successor, the Grumman Gulfhawk II.

**Workbench . . . Continued from page 4** on obtaining 3-views.

"Love your magazine — Keep up the good work."

Bill's flights were witnessed and verified by John Martin and Gary Myers. Your free subscription has been entered, Bill. Congratulations.

**WARNING!**

According to a report in "Hot Head," newsletter for the Vancouver (B.C.) Gas Model Club, the catalyst, hardener, or accelerator that is added to fiberglass resin is extremely hazardous. An eye specialist, reporting to the Labor - Management Safety Conference in Vancouver, revealed that a drop of this catalyst in the eye will progressively destroy the tissue of the eye and result in blindness. This will occur even though an attempt is made to wash the catalyst from the eye. Furthermore, once the chemical has started to destroy the eye, there is no known way of stopping the destruction or of repairing the damage.

As in the case of those attending the conference, this hazard has probably been unknown to most modelers, who have used fiberglass resins quite regularly during model construction. We don't wish to be alarmists, nor do we suggest that you ignore the warning . . . play it safe and protect your eyes when handling any chemical.

**IGNITION IS NOT DEAD!**

According to "Dope Bucket" editor Mark Fechner, Utah State Aeromodeler

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**SCALE PLANS.** Big 30 x 42 Blueines. All 1" = 1 foot. 3-Sheet sets: Douglas O-25C, YO-31A/O-31B, YO-31C/Y10-43, O-43A, O-46A, Fokker D-17; \$4.50 each. 2-Sheet sets: Douglas O-38, Davis D-1K; \$3.00 each. General Western Meteor, 1 sheet, \$1.50. Mailed folded and postpaid PETER W. WESTBURG, 834 Seventh St., No. 6, Santa Monica, California 90403

**WANTED:** Major Models kits; Mirage, Saulnier, and Eindecker. Also ignition engines. Will buy or swap for R/C or U/C engines. Frank Schwartz, 2400 West End Ave., Nashville, Tenn. 37203

**BACK ISSUES.** Flying Aces, Air Trails, M.A.N., pulps, etc. List for SASE: AVIATION MAGAZINES, 24248 Crenshaw Blvd., Torrance, Ca. 90505 (213) 325-3640 "AERODESIGN HANDBOOK"; Sailplanes, F/F, Nordics, Sport. Clear instructions. Over 175 airfoils, \$4.95. Eric Lister, 953 Klockner Road, Trenton, New Jersey 08619.

Model airplane plans. Peanut, rubber, CO<sub>2</sub>, gas. Free list. Send self addressed, stamped envelope to Modernistic Models, Box 6932 Burbank, California 91510.

**STOP WATCHES:** 1/10 sec., 15 minutes lapsed time, 30 sec. large hand. Guaranteed. \$33.00. Custom Hobbies, 2408 E. Platte Ave., Colorado Springs, Colo. 80909

Peanut Scale Plans, competition-tested balsa props & wheels. New expanded list. S.A.S.E. Stan Fink, 80 Crest Dr., Eugene, Ore. 97405

New from BUZZER . . . Plans for .020 Replica Old Timer. SUPER SUNDUSTER 36", two sheets, \$4.95; TOPPER, 33", \$2.75. Also Dick Korda's Gold Star, 1939, \$1.50. Two new Peanuts; 1913 French Racer, "PONNIER", beautiful, obscure flyer, \$1.25, \$3.75 with silk spoked wheels. Lincoln Biplane, cutest Peanut around, same prices. Watch for more. Kits for CO<sub>2</sub>, limited number available with engines(!). Buzzard Bombshell, Super Sunduster, Mini-Ruler, \$4.50 ea, \$8.00 with FH wheels. PermaBond 30 sec. contact cement, \$1.50. Add 10% all orders to cover postage and handling. BUZZER MODEL AIRPLANE CO., 52 Newbury Rd., Lakewood, N.J. 08701.

The very best of those Old Timer Plans from kits and magazines of the '30's. PRINTED black on heavy white paper. Third list now ready. Send SASE. Golden Age Reproductions, Box 13, Braintree, Mass. 02184.

**PROFILES** by Plecan. Two giant 24" x 36" charts of well known Free Flight designs of the 1934/1963 era. Total of 77 profiles to same scale, with basic data. Great for den or workshop. \$3.95 postpaid (in mailing tube). Calif. res. add 6% tax. Paul Plecan, Box 1556 Garden Grove, California 92642.

Original and classic Peanut, Sport, and Scale rubber plans. Send \$1.00 for two Peanuts and list. Fallston Plans Service, Box 133, Phoenix, Maryland 21131.

CASH for your used engine. Any type or condition. For details, write: T. Cross, 100 Smyrna St., West Springfield, Ma 01089

Lin Haslam has recently set a Class B, Cat I, R.O.W. record with his Thor .24 ignition powered Stormer, an Old Timer pylon type model designed by Ray Schofield. The engine is the prototype of an engine to come out sometime this summer. It will also be available as a .19. Mark is located at 112 Clinton Ave., SLC, Utah 84103, if you want to find out more about this engine.

**THOSE 1936 NATS WINNERS**

Since running that picture of 1936 Nats trophy winners in John Pond's "Plug Sparks" column (May 1974 issue), we've received quite a few interesting cards and letters . . . some from individuals who were in the picture. As a matter of fact, we've decided now that rather than simply publish the names, we'll take it further and do a "where are they now" type article sometime in the near future.

In the meantime, if anyone happens to know the whereabouts of Jessie Bieberman, Robert Copland, Wilbur Tyler, Al Courtial, Sheldon Bell, Joe Buehrle, Melvin Yates, Roy Wriston, Bronik Soroka, Bruce Luckett, Alvie Dague, Ervin Leshar, Albert Judge, John Haw, Joe Matulis, or Mike Kostich . . . let us know. The others have been located and/or accounted for.

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ing Circus Club and MODEL BUILDER Magazine, the West Coast Helicopter Championships have been scheduled for Sunday, September 22, 1974, at Oxnard Air Force Base, Camarillo, California.

There will be separate competition categories, and trophies, for beginners and experts, also awards for best scale and scratch-built models. More details will be published at a later date, but in the meantime, contact MODEL BUILDER for any available information. Contest Directors will be Norm Blessum (805) 492-1003 and Tom Roe (805) 482-0250.

MODEL BUILDER will also be co-sponsoring, the Annual Southwest Quarter Midget Championships, December 7 and 8, 1974, with the Chula Vista (California) Model and Radio Control Club, in cooperation with the QMRC.

Largest Quarter Midget race of the year, registration is by pre-entry, with a deadline of November 15. Write to Ramzi Thomas, 3716 Duffy Way, Bonita, California 92002. Racing rules and a location map will be mailed upon re-

ceiving entry. Entry fee of \$10.00 will be collected at flying site. More information will be published later.

### OTHER THINGS TO DO

The Barons R/C Club of Spokane, Washington is hosting a Stand-Off Scale meet on August 10 and 11. The meet will be held at Henley Aerodrome, which is 15 miles north of Coeur d'Alene, Idaho on Highway 95. (Henley is the Northwest's answer to Rhinebeck).

There will be four categories: WW I, WW II, Sport, and Biplanes. Multiple entries will be allowed in different categories. WW I and II, plus Sport, will fly AMA pattern. The biplane category will fly the new N.S.P.A. pattern.

The Aerodrome features full size flying activities, such as a Fokker Triplane and a Nieuport 24 dogfighting, the Henley "Flying Circus" in Tiger Moths, a 1930 Great Lakes doing aerobatics, the Henley Hummers sky diving team doing 10-man stars; plus rides in open cockpit airplanes, hot air balloons, or a Piper J-3 Cub.

If that isn't enough, EXPO 74, in Spokane, is just 30 miles away. For additional information, contact Gil

Horstman, 11223 La Crosse, Spokane, Wash. 99206. Too bad it's during the AMA Nationals.

The Asociacion de Clubs de Aeromodelismo de La Republica Mexicana, A.C. (puff . . . puff!) invites all modelers to their International Competition on November 15 through 20, 1974, in Mexico City.

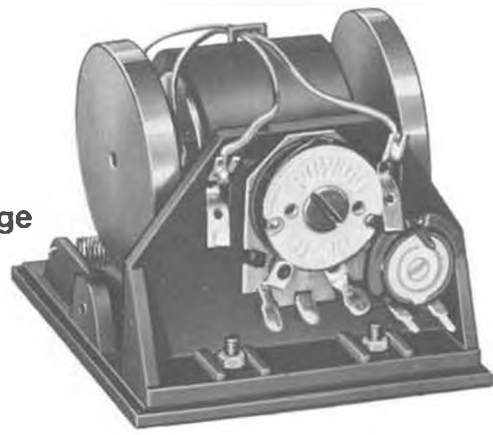
A contest for all model airplane types, there will be U-Control Stunt, Slow Combat, Racing, and Open Combat; also free flight FAI Power, 1/2A Gas, Wakefield, Winter Coupe, and Nordic A/1 & A/2; and also R/C Pattern, Formula I, Open, and F.A.I. Pylon racing, and glider aerobatics.

All types of travel and accommodation arrangements are being made. For further information, find yourself a large envelope and write to the above organization, Registrada en La Secretaria de Comunicaciones Y Transportes, Av. Cuauhtemoc No. 60 Ter., Piso, Mexico 7, D.F. If you wish to call, the phone number is 21-61-08.

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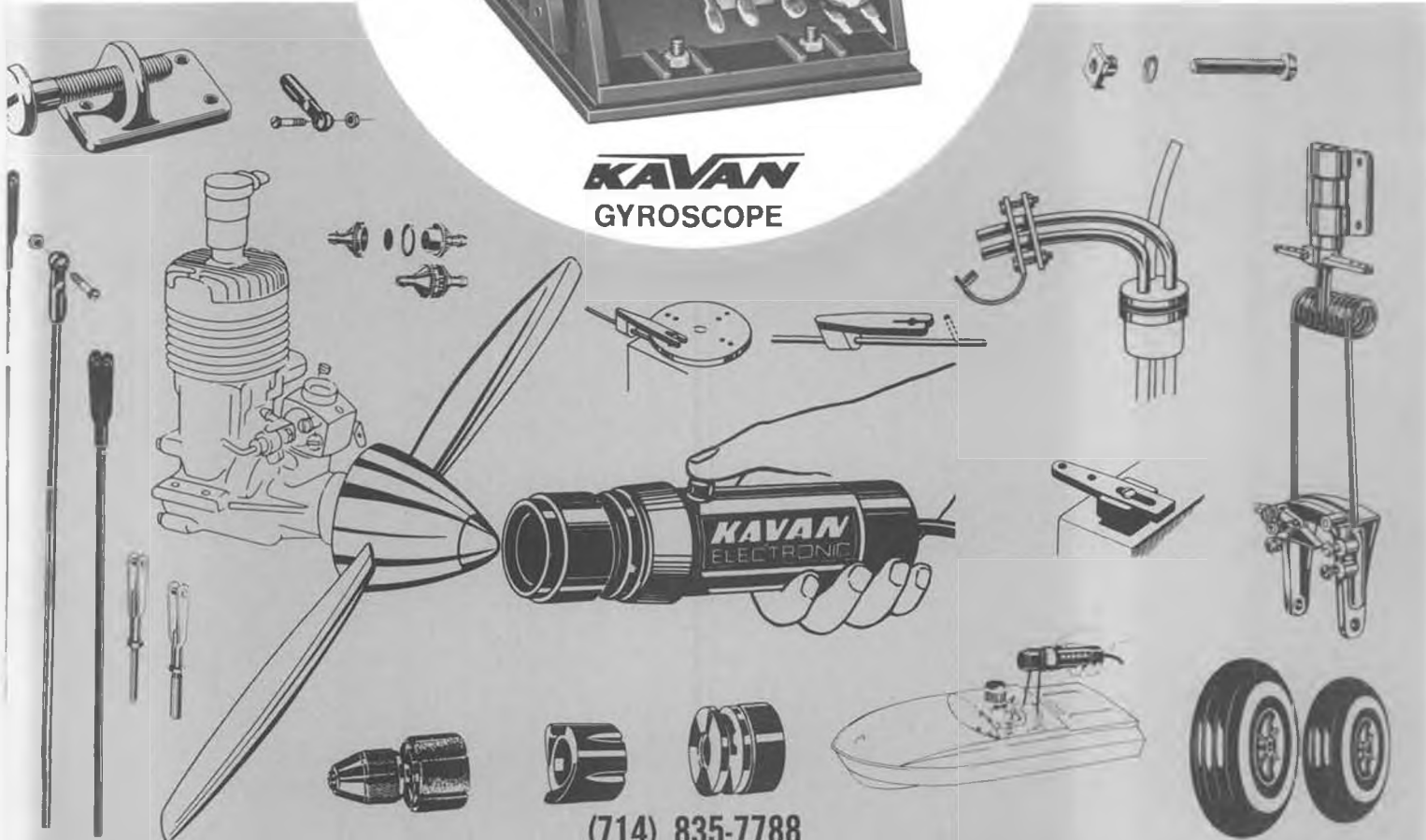
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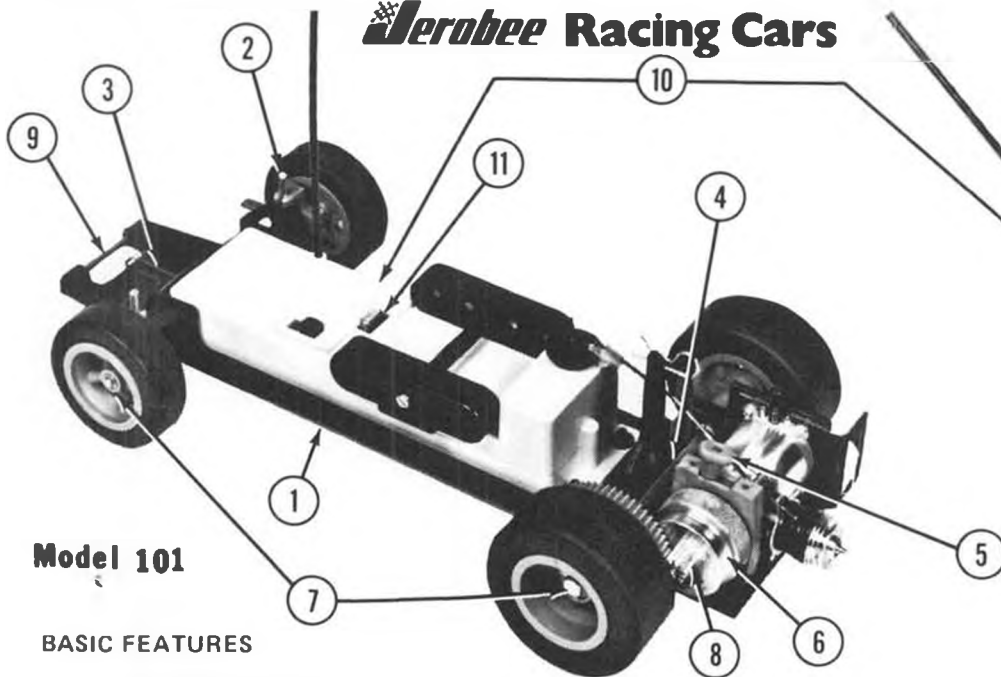
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